Bureau of Entomology & Plant Quarantine

Division of Plant Disease Control

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967004

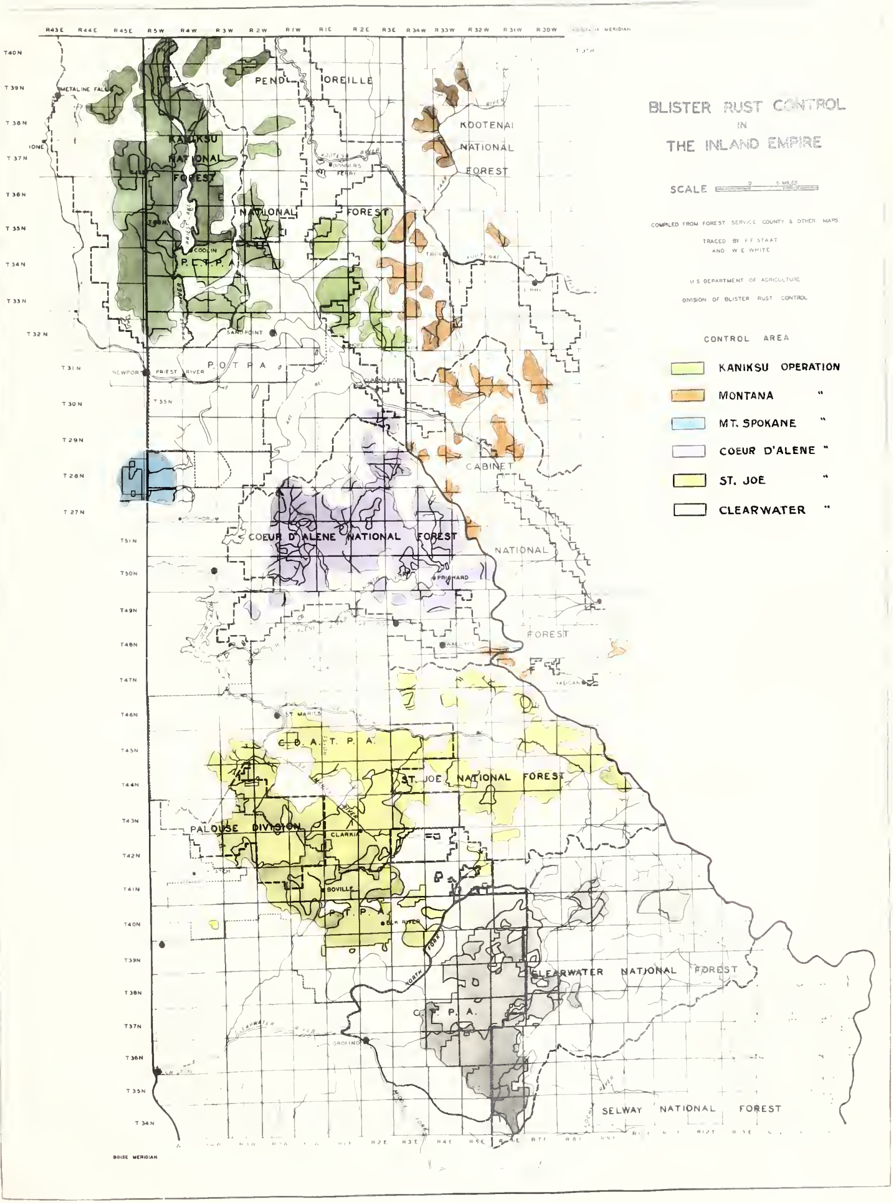

BLISTER RUST CONTROL
IN
THE INLAND EMPIRE
SCALE
COMPILED FROM FOREST SERVICE COUNTY & OTHER MAPS
TRACED BY F. F. STAAT
AND W. E. WHITE
U. S. DEPARTMENT OF AGRICULTURE
DIVISION OF BLISTER RUST CONTROL
CONTROL AREA
KANIKSU OPERATION
MONTANA "
MT. SPOKANE "
COEUR D'ALENE "
ST. JOE "
CLEARWATER "
KANIKSU NATIONAL FOREST
PEND OREILLE NATIONAL FOREST
KOOTENAI NATIONAL FOREST
CABINET NATIONAL FOREST
COEUR D'ALENE NATIONAL FOREST
ST. JOE NATIONAL FOREST
CLEARWATER NATIONAL FOREST
SELWAY NATIONAL FOREST
PALOUSE DIVISION
P. O. T. P. A.
C. D. A. T. P. A.
P. T. P. A.
C. T. P. A.
METALINE FALLS
IONE
NEWPORT
PRIEST RIVER
SANDPOINT
COOLIN
CLARK FORK
PRICHARD
WALLACE
ST. MARIES
CLARKIA
BOVILL
ELK RIVER
OROFINO
BOISE MERIDIAN

TABLE NO. 1

FEDERAL EXPENDITURES, NORTHWESTERN DIVISION OF BLISTER RUST CONTROL
CALENDAR YEAR 1938, REGULAR APPROPRIATIONS

	Project	January 1 to June 30, 1938			July 1 to December 31, 1938			Grand Total
		Salaries	Expense	Total	Salaries	Expense	Total	
2.2	Development of Methods of Ribes Eradication							
	2.22 - Method Studies of Ribes Eradication, Idaho	$	$ 177.44	$ 177.44	$	$	$	$ 177.44
3.2	Cooperative Ribes Eradication on Federal Lands							
	3.21-2 - Cabinet National Forest, Montana	669.62	126.12	795.74	787.48	75.85	863.33	1,659.07
	3.21-3 - Kootenai National Forest, Montana	649.98	9.07	659.05	649.98		649.98	1,309.03
3.3	Cooperative Ribes Eradication on National Parks							
	3.31 - Glacier National Park, Montana					36.00	36.00	36.00
	3.33-1 - Mount Rainier National Park, Washington		11.60	11.60				11.60
	3.36 - Yellowstone National Park, Wyoming				533.32	65.32	598.64	598.64
3.4	Cooperative Ribes Eradication on State and Private Lands							
	3.42-1 - Clearwater Operation, Idaho	3,735.70	492.39	4,228.09	2,255.79		2,255.79	6,483.88
	3.42-2 - St. Joe Operation, Idaho	3,796.18	654.89	4,451.07	2,335.96		2,335.96	6,787.03
	3.42-3 - Coeur d'Alene Operation, Idaho	1,568.38	203.50	1,771.88	513.05		513.05	2,284.93
	3.42-4 - Kaniksu Operation, Idaho	3,391.11	2,827.98	6,219.09	2,219.13		2,219.13	8,438.22
	3.42-5 - Mount Spokane Operation, Idaho	410.51	90.47	500.98				500.98
	3.43-2 - Mount Spokane Operation, Washington	1,566.66	172.29	1,738.95	533.32		533.32	2,272.27
	3.46 - Medicine Bow Operation, Wyoming	649.98		649.98				649.98
	3.47 - Pike Operation, Colorado	649.98	66.20	716.18	1,084.32		1,084.32	1,800.50
4.1	Field Studies, Spread of the Rust							
	4.12 - Idaho	2,497.68	127.88	2,625.56	1,650.00	1.75	1,651.75	4,277.31
	4.13 - Washington		40.00	40.00		70.00	70.00	110.00
6.	Educational Work	1,299.96	489.47	1,789.43	1,299.96	5.05	1,305.01	3,094.44
9.	Maintenance of Field Office and Miscellaneous Expenses							
	9.1 - Supervision	2,299.92	117.25	2,417.17	2,299.92	14.51	2,314.43	4,731.60
	9.2 - Office Maintenance	8,418.87	1,180.62	9,599.49	4,559.88		4,559.88	14,159.37
	9.3 - Miscellaneous Supplies and Services		74.16	74.16				74.16
	9.4 - Purchases made in Washington, D. C.		552.50	552.50				552.50
	Grand Total	$31,604.53	$7,413.83	$39,018.36	$20,722.11	$268.48	$20,990.59	$60,008.95

TABLE NO. 2

FEDERAL EXPENDITURES, NORTHWESTERN DIVISION OF BLISTER RUST CONTROL
JANUARY 1-JUNE 30, 1938
501082, EMERGENCY RELIEF, AGRICULTURE, ENTOMOLOGY AND PLANT QUARANTINE, PUBLIC BUILDINGS, PARKS, UTILITIES, FLOOD CONTROL, ETC. 1938

Project		Salaries	Expense	Total
501-2-108, Idaho				
8.12	Field Studies, Pine Disease Survey	$ 4,591.56	$ 72.17	$ 4,663.73
8.22	Method Studies of Ribes Eradication		21.76	21.76
8.42-1	Cooperative Ribes Eradication, Clearwater Operation	17,247.79	13,149.84	30,397.63
8.42-2	Cooperative Ribes Eradication, St. Joe Operation	21,585.89	16,732.22	38,318.11
8.42-3	Cooperative Ribes Eradication, Coeur d'Alene Operation	9,357.27	6,606.63	15,963.90
8.42-4	Cooperative Ribes Eradication, Kaniksu Operation	26,918.22	14,012.78	40,931.00
8.42-5	Cooperative Ribes Eradication, Mt. Spokane Operation	7,432.53	4,375.77	11,808.30
8.6	Educational Work		87.80	87.80
8.9-1	Supervision		6.43	6.43
8.9-2	Spokane Office Maintenance		1,287.71	1,287.71
8.9-3	Miscellaneous Supplies and Services		410.51	410.51
	Total 501-2-108, Idaho	87,133.26	56,763.62	143,896.88
501-2-108, Washington				
8.13	Field Studies, Pine Disease Survey		290.84	290.84
8.23	Method Studies of Ribes Eradication		2.04	2.04
8.33-1	Cooperative Ribes Eradication, Mt. Rainier National Park		9.33	9.33
8.43-1	Cooperative Ribes Eradication, Kaniksu Operation		50.47	50.47
8.43-2	Cooperative Ribes Eradication, Mt. Spokane Operation	11,277.44	6,942.98	18,220.42
8.6	Educational Work	1,266.17	413.94	1,680.11
8.9-1	Supervision		25.07	25.07
8.9-2	Spokane Office Maintenance	6,784.13	29.55	6,813.68
8.9-3	Miscellaneous Supplies and Services	666.64	947.14	1,613.78
	Total 501-2-108, Washington	19,994.38	8,711.36	28,705.74
501-2-108, Wyoming				
8.46	Cooperative Ribes Eradication, Medicine Bow Operation		212.33	212.33
	Total 501-2-108, Wyoming		212.33	212.33
501-2-108, Colorado				
8.47	Cooperative Ribes Eradication, Pike Operation	1,412.86	1,329.03	2,741.89
	Total 501-2-108, Colorado	1,412.86	1,329.03	2,741.89
Grand Total January 1-June 30, 1938		$108,540.50	$67,016.34	$175,556.84

501009, EMERGENCY RELIEF, AGRICULTURE, ADMINISTRATIVE EXPENSE, 1938

501-9-1,	Administrative			
8.6	Educational Work		139.96	139.96
8.9-2	Spokane Office Maintenance	420.00		420.00
8.9-3	Miscellaneous Supplies and Services		131.34	131.34
	Total 501-9-1,	420.00	271.30	691.30
201-1 (Washington)				
8.6	Educational Work		.90	.90
8.9-2	Spokane Office Maintenance	2,499.96		2,499.96
8.9-3	Miscellaneous Supplies and Services		7.50	7.50
	Total 201-1 (Washington) Administrative	2,499.96	8.40	2,508.36
Grand Total January 1-June 30, 1938		$ 2,919.96	$ 279.70	$ 3,199.66

TABLE NO. 3

FEDERAL EXPENDITURES, NORTHWESTERN DIVISION OF BLISTER RUST CONTROL
JULY 1-DECEMBER 31, 1938
701082-658/9999 EMERGENCY RELIEF, AGRICULTURE, ENTOMOLOGY AND PLANT QUARANTINE,
PUBLIC BUILDINGS, PARKS, UTILITIES, FLOOD CONTROL, ETC. (TRANSFER FROM WPA) 1938-1939

Project	Salaries	Expense	Total
701-2-281, Idaho			
8.12 Field Studies, Pine Disease Survey	$ 4,819.98	$ 411.11	$ 5,231.09
8.22 Method Studies of Ribes Eradication		72.99	72.99
8.42-1 Cooperative Ribes Eradication, Clearwater Operation	48,029.87	12,161.52	60,191.39
8.42-2 Cooperative Ribes Eradication, St. Joe Operation	56,182.20	13,400.36	69,582.56
8.42-3 Cooperative Ribes Eradication, Coeur d'Alene Operation	16,780.80	3,780.34	20,561.14
8.42-4 Cooperative Ribes Eradication, Kaniksu Operation	28,967.07	6,414.85	35,381.92
8.42-5 Cooperative Ribes Eradication, Mount Spokane Operation	10,286.33	2,029.99	12,316.32
8.6 Educational Work		31.18	31.18
8.9-1 Supervision		114.04	114.04
8.9-2 Spokane Office Maintenance	2,726.64	2,362.12	5,088.76
8.9-3 Miscellaneous Supplies and Services		39.14	39.14
Total 701-2-281, Idaho	167,792.89	40,817.64	208,610.53
701-2-100, Washington			
8.13 Field Studies, Pine Disease Survey	65.00		65.00
8.23 Method Studies of Ribes Eradication		12.27	12.27
8.33-1 Cooperative Ribes Eradication, Mount Rainier National Park		89.09	89.09
8.43-2 Cooperative Ribes Eradication, Mount Spokane Operation	23,744.57	3,427.52	27,172.09
8.6 Educational Work	1,000.00	215.69	1,215.69
8.9-1 Supervision		89.96	89.96
8.9-2 Spokane Office Maintenance	6,778.35	5.88	6,784.23
8.9-3 Miscellaneous Supplies and Services		313.23	313.23
Total 701-2-100, Washington	31,587.92	4,153.64	35,741.56
701-2-279, Colorado			
8.47 Cooperative Ribes Eradication, Pike Operation	3,245.36	927.31	4,172.67
Total 701-2-279, Colorado	3,245.36	927.31	4,172.67
Grand Total July 1-December 31, 1938	$202,626.17	$45,898.59	$248,524.76

701089-658/9999 EMERGENCY RELIEF, AGRICULTURE, ENTOMOLOGY AND PLANT QUARANTINE,
ADMINISTRATIVE EXPENSE (TRANSFER FROM WPA) 1938-1939

701-9-2 (Washington) Project 2014			
8.9-2 Spokane Office Maintenance	745.00		745.00
8.9-3 Miscellaneous Supplies and Services		5.00	5.00
Total 701089	745.00	5.00	750.00

701009-658/9999 EMERGENCY RELIEF, AGRICULTURE, ENTOMOLOGY AND PLANT QUARANTINE,
ADMINISTRATIVE EXPENSE (TRANSFER FROM WPA) 1938-1939

701-9-2 (Washington) Project 2027			
8.9-2 Spokane Office Maintenance	1,740.00		1,740.00
Total 701009	$ 1,740.00		$ 1,740.00

TABLE NO. 4

SUMMARY OF FEDERAL EXPENDITURES, NORTHWESTERN REGION OF BLISTER RUST CONTROL
BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE
1922 - 1938

State	Appropriation	Total	Activity												
			Ribes Eradication	Methods Development	Chemical Investigation	Reconnaissance and Preeradication	Ecology	Disease Survey and Scouting	Damage Studies	Education	Quarantine Enforcement	Cultivated Black Currant Eradication	Nursery Sanitation	Office and Miscellaneous	Supervision
Idaho	Regular	$1,064,282.53	$ 558,293.05	$ 92,377.45	$ 64,575.98	$ 54,033.32	$45,103.42	$19,929.38	$25,679.88	$31,006.49	$ 10,758.86	$28,173.15		$104,887.13	$ 29,565.97
	NIRA	470,841.62	423,058.33	4,662.40	3,441.74		3,293.09			6,366.50				28,083.64	1,935.92
	ERA	2,351,002.41	2,276,574.34	351.11	937.99			25,770.60		2,872.09	1,456.86			41,418.68	1,519.19
	Total	3,886,126.56	3,257,925.72	97,390.96	68,955.71	54,033.32	48,396.51	45,699.98	25,679.88	40,245.08	12,215.72	28,173.15		174,389.45	33,021.08
Montana	Regular	176,856.19	22,232.16	11,656.90	15,809.93	11,008.17	2,533.00	13,928.33	7,517.94	8,027.01	9,781.81	22,010.30	$15,160.41	27,105.49	10,084.74
	NIRA	88,306.79	80,458.56		258.00	902.74				2,689.14			148.36	3,287.99	562.00
	ERA	196,847.11	193,848.79					219.31		32.72				2,730.30	16.00
	Total	462,010.09	296,539.50	11,656.90	16,067.93	11,910.91	2,533.00	14,147.64	7,517.94	10,748.87	9,781.81	22,010.30	15,308.77	33,123.78	10,662.74
Washington	Regular	198,844.41	14,125.16	750.00	12,837.91	4,770.40	2,425.10	20,891.49	8,150.83	6,242.32	18,957.24	63,838.81	2,273.74	28,921.12	14,660.29
	NIRA	105,199.60	92,044.82		274.01					3,170.46				9,148.31	562.00
	ERA	360,390.44	232,243.02	72.88	41.74	223.37		1,558.96		9,033.51				117,068.81	148.15
	Total	664,434.45	338,413.00	822.88	13,153.66	4,993.77	2,425.10	22,450.45	8,150.83	18,446.29	18,957.24	63,838.81	2,273.74	155,138.24	15,370.44
Total Western White Pine Region	Regular	1,439,983.13	594,650.37	104,784.35	92,223.82	69,811.89	50,061.52	54,749.20	41,348.65	45,275.82	39,497.91	114,022.26	17,434.15	160,913.74	54,311.00
	NIRA	664,348.01	595,561.71	4,662.40	3,973.75	902.74	3,293.09			12,226.10			148.36	40,519.94	3,059.92
	ERA	2,908,239.96	2,702,666.14	423.99	979.73	223.37		27,548.87		11,938.32	1,456.86			161,217.79	1,683.34
	Total	5,012,571.10	3,892,878.22	109,870.74	98,177.30	70,938.00	53,354.61	82,298.07	41,348.65	69,440.24	40,954.77	114,022.26	17,582.51	362,651.47	59,054.26
Colorado	Regular	10,985.40	5,509.48		700.00			611.65		360.00	136.68			2,606.40	1,061.19
	NIRA	8,041.45		823.28	52.00	6,422.74				100.00				520.43	123.00
	ERA	58,921.52	54,444.49		124.11	15.11				37.00				4,175.81	125.00
	Total	77,948.37	59,953.97	823.28	876.11	6,437.85		611.65		497.00	136.68			7,302.64	1,309.19
Wyoming	Regular	9,803.82	4,318.27		700.00	598.64		214.11		359.84	47.85			2,567.14	997.97
	NIRA	7,107.41			191.42	5,641.49				100.00				1,051.50	123.00
	ERA	58,383.75	54,251.13			30.60				193.22				3,734.87	173.93
	Total	75,294.98	58,569.40		891.42	6,270.73		214.11		653.06	47.85			7,353.51	1,294.90
Total Central Rocky Mountain Region	Regular	20,789.22	9,827.75		1,400.00	598.64		825.76		719.84	184.53			5,173.54	2,059.16
	NIRA	15,148.86		823.28	243.43	12,064.23				300.00				1,571.93	246.00
	ERA	117,305.27	108,695.62		124.11	45.71				230.22				7,910.68	298.93
	Total	153,243.35	118,523.37	823.28	1,767.53	12,708.59		825.76		1,150.06	184.53			14,656.15	2,604.09
Total Northwestern Region	Regular	1,460,772.35	604,478.12	104,784.35	94,623.82	70,410.53	50,061.52	55,574.96	41,348.65	45,995.66	39,682.44	114,022.26	17,434.15	166,087.28	56,370.16
	NIRA	679,496.87	595,561.71	5,485.68	4,217.17	12,966.97	3,293.09			12,426.10			148.36	42,091.87	3,305.92
	ERA	3,025,545.23	2,811,361.76	423.99	1,103.84	269.08		27,546.87		12,168.54	1,456.86			169,128.47	1,982.27
	Total	$5,165,814.45	$4,011,401.59	$110,694.02	$99,944.83	$83,646.58	$53,354.61	$83,123.83	$41,348.65	$70,590.30	$41,139.30	$114,022.26	$17,582.51	$377,307.62	$61,658.35

[illegible]

[illegible]

State	Forest	Regular	[illegible]	[illegible]
Montana	Cabinet	$ [illegible]	$ 14[illegible]	$ [illegible]
	Kootenai	[illegible]		[illegible]
	Total	[illegible]	149,[illegible]	[illegible]
Washington	Kaniksu	[illegible]	1[illegible]	
Idaho	Kaniksu	[illegible]	185,70[illegible]	[illegible]
	Coeur d'Alene	3[illegible]	[illegible],395 [illegible]	[illegible]
	St. Joe	[illegible]	[illegible]	[illegible]
	Clearwater	[illegible]	[illegible]	[illegible]
	Total	[illegible]	[illegible]	[illegible]
Grand Total		$1,[illegible]	$1,[illegible]	[illegible]

Table No. [illegible]

SUMMARY OF EXPENDITURES BY STATE AND PRIVATE [illegible]
[illegible] IDAHO

Year	State	Private	Total
[illegible]	$ [illegible]	$ [illegible]	$ [illegible]
[illegible]		[illegible]	[illegible]
[illegible]		[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]		[illegible]	[illegible]
[illegible]			
[illegible]	[illegible]		[illegible]
[illegible]	[illegible]		[illegible]
[illegible]	[illegible]		[illegible]
1937	[illegible]		[illegible]
1938	[illegible]		[illegible]
Total	$[illegible]	$[illegible]	$[illegible]

Mount Rainier National Park expenditures (regular appropriation): $[illegible]

[illegible]

[illegible]

a. [illegible]
Technical Supervisor, [illegible]

b. [illegible] Operation, Idaho
[illegible]
Checking Supervisor, [illegible]

c. [illegible], Idaho
Technical Supervisor, [illegible]
Assistant, [illegible]
Checking Supervisor, [illegible]

d. Coeur d'Alene Operation, Idaho
Technical Supervisor, [illegible]

e. [illegible] Operation, Idaho and Washington
Technical Supervisor, [illegible]
Checking Supervisor, [illegible]

f. [illegible]
Technical Supervisor, [illegible]

g. [illegible]
Technical Supervisor, [illegible]
Assistant in Charge, [illegible]

[illegible] Projects

a. [illegible]
In Charge, [illegible]
Assistant, [illegible]

b. Development of [illegible]
[illegible]
[illegible]

c. Instructional Work
In Charge, [illegible]
Assistant, [illegible]

[illegible]

[illegible]

[illegible]

[illegible] Senior Clerk, assisted by [illegible] Clerk-Stenographer.

[illegible] Senior Clerk, assisted by [illegible] Clerk-Stenographer; [illegible] and [illegible] Typists.

[illegible] Langley, Junior Administrative Assistant, [illegible]

The following is the personnel of the [illegible] blister rust control work on National Forest lands:

1. Cabinet and Kootenai National Forests, Montana [illegible] Pathologist.

2. Clearwater National Forest, Idaho [illegible]

3. St. Joe National Forest, Idaho [illegible]

4. Coeur d'Alene National Forest, Idaho [illegible] and [illegible] Field Assistant.

5. [illegible] National Forest, Idaho and Wyoming [illegible] Pathologist.

INTRODUCTION

Blister rust control work in the Inland Empire during the [illegible] season was conducted by the Bureau of Entomology and Plant Quarantine and the U. S. Forest Service. This program was supplemented by [illegible] operating on funds from the State of Idaho and the [illegible] Entomology and Plant Quarantine. [illegible] the CCC camps [illegible] were assigned to blister rust control work [illegible].

The division of responsibility as incorporated in the [illegible] understanding between the Bureau of Entomology and Plant Quarantine and the U. S. Forest Service prepared in [illegible] for direction of blister rust work in the Inland Empire, continued in effect during the [illegible].

The organization of the field work since the inception of the rust control program has been handled by individual operations. [illegible] includes a National Forest and adjacent private and state lands [illegible] show the complete progress of blister rust control work [illegible] work of all cooperating agencies is described in this report [illegible] Empire.

Detailed reports on [illegible] are prepared [illegible] each operation as indicated below:

1. Montana Operation (Kootenai and Cabinet [illegible])
2. Clearwater Operation
3. St. Joe Operation
4. Coeur d'Alene Operation
5. Kaniksu Operation
6. Mount Spokane Operation

The report for the Inland Empire represents the [illegible] performed on all of the above operations.

[illegible]

[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
S-CCC	2	[illegible]
State Cooperative	[illegible]	[illegible]
Total	[illegible]	[illegible]

Legend of symbols used in report [illegible]

BQ - Bureau of Entomology and Plant Quarantine
FS - Forest Service
Reg - Program on regular [illegible]
ERA - Emergency Relief program
F-CCC - Forest Service - Civilian Conservation Corps
S-CCC - State - Civilian Conservation Corps
State Coop - Program financed cooperatively between Bureau [illegible]
NIRA - Public Works program

Health and Sanitation. [illegible] during the year in the portable camp units, showers, and [illegible] in the kitchens. These units have worked out very satisfactorily [illegible] organizations have shown interest in them.

First aid men and registered male nurses were [illegible] ations employing a large number of men. Frequent inspections [illegible] camps to see that proper sanitation instructions were being [illegible] cooperation was given by the Idaho State Board of Health and [illegible]

CHECKING AND SURVEYS

Checking was conducted along the same lines as in [illegible] analysis of the work performed to date shows that [illegible] tenance basis and [illegible] acres require [illegible]

Control Area. In 1934, after a careful [illegible] of reconnaissance, timber and [illegible] surveys, [illegible] white pine control area of [illegible] acres. [illegible] boundaries of this control area various changes [illegible] at the time ribes eradication work was performed. [illegible] to make a thorough review of the Control Area [illegible] make such revisions of boundaries on unworked areas [illegible] [illegible], all doubtful areas were examined. Representatives [illegible]

[illegible] and the Bureau of Entomology and Plant Quarantine [illegible] for all [illegible]. [illegible] of white pine lands [illegible] control [illegible] of 25,774 acres.

Pine Disease Survey. The results of these surveys [illegible] a separate report. The general distribution of blister rust [illegible] described in previous reports. The intensification which [illegible] in certain areas is serious, and severe losses in these [illegible] take place.

STATEMENT OF EXPENDITURES AND COSTS

The statement of expenditures and costs includes [illegible] from appropriations directly allotted to the Bureau of Entomology and Plant Quarantine, the U. S. Forest Service and funds turned over [illegible] State of Idaho for use in ribes eradication on state lands. The appropriations to the Bureau and the U. S. Forest Service were those [illegible] the Emergency Relief Act and the regular appropriations for blister rust work.

TABLE NO. 1

EXPENDITURES BY APPROPRIATIONS, CALENDAR YEAR [illegible]
INLAND EMPIRE

Cooperating Agency	Appropriation	Amount
Forest Service	Regular	[illegible]
	ERA	[illegible]
	Total	[illegible]
Bureau of Entomology and Plant Quarantine	Regular Montana	[illegible]
	Regular Idaho	[illegible]
	Regular Washington	[illegible]
	ERA Idaho	[illegible]
	ERA Washington	[illegible]
	Total	[illegible]
State of Idaho	State of Idaho	[illegible]
Total Expenditures	All Appropriations	$[illegible]

TABLE NO. 2

CLASSIFIED EXPENDITURES, CALENDAR YEAR 193[illegible]

[illegible]

Item	Forest Service			Bureau of Entomology and Plant Quarantine			State of Idaho	[illegible]
	Regular	ERA	Total	Regular	ERA	Total		
Sal. perm. per.	$ 16,[illegible]		$ 16,863.[illegible]	$[illegible] 161.47	$ [illegible]	$ [illegible]		$ [illegible]
Sal. temp. per.	[illegible] 527.62	$ 11,[illegible].24	[illegible]		31,[illegible]	31,[illegible]		[illegible]
Wages, temp. labor	158,[illegible].73	75,[illegible].91	[illegible] 190.49	921.39	[illegible] 018.15	786,039.57	$11,[illegible].44	[illegible]
Other supplies	[illegible] 63	21,[illegible]	75,[illegible] 24	1,367.79	74,[illegible] 17	[illegible]		[illegible]
Equipment	[illegible] 618.64	[illegible] 495.37	13,[illegible]	639.41	[illegible]	[illegible]		[illegible]
Trucks	[illegible]	1,[illegible]	[illegible]		1,[illegible]	[illegible]		
Travel and [illegible]	[illegible]	[illegible] 06	[illegible]	[illegible] 49	11,[illegible]	[illegible]		
Contracts	[illegible]	7.60	[illegible]					
[illegible]	[illegible]	195.64	[illegible]					
Other [illegible]	[illegible]	[illegible]	13,[illegible]	[illegible]	[illegible]	[illegible]		
Total	[illegible]	[illegible] 656.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	

ACTIVITY COSTS

[illegible]

Activity	Number Effective Man Days	Source	Cost	
BQ ERA	60,866	BQ ERA	$157,8[illegible]	[illegible]
		BQ Reg.	[illegible]	[illegible]
		Total	[illegible]	[illegible]
FS ERA	15,340	FS Reg.	15,[illegible]	[illegible]
		FS ERA	104,5[illegible]	[illegible]
		BQ ERA	[illegible]	[illegible]
		BQ Reg.	[illegible]	[illegible]
		Total	[illegible]	[illegible]
FS Reg.	97,610	FS Reg.	[illegible]	[illegible]
		BQ ERA	[illegible]	[illegible]
		BQ Reg.	[illegible]	[illegible]
		Total	[illegible]	[illegible]
Beaver Comp.	2,196	State	[illegible]	[illegible]
		BQ Reg.	[illegible]	[illegible]
		Total	[illegible]	[illegible]
CCC	[illegible]	FS Reg.	[illegible]	[illegible]
		BQ ERA	[illegible]	[illegible]
		FS ERA	[illegible]	[illegible]
		Total	[illegible]	[illegible]
[illegible]	1,000	FS Reg.	[illegible]	[illegible]
BQ ERA Winter Pro.	[illegible]	BQ ERA	[illegible]	[illegible]
FS ERA Winter Pro.	[illegible]	FS ERA	[illegible]	[illegible]
[illegible]		FS ERA	[illegible]	[illegible]
[illegible] Survey		FS Reg.	[illegible]	[illegible]
Total Cost 1936 Program			[illegible]	[illegible]

	[illegible]
Number of meals served	[illegible]
Average cost per meal	$ .19
Pounds grain used	[illegible]
Pounds chemical used	111,2[illegible]

SUMMARY OF RIBES ERADICATION, 1938
INLAND EMPIRE

TABLE NO. 3 - SUMMARY OF ALL WORKINGS

Eradication Type	Acres First Working	Acres Second Working	Acres Third Working	Total Acres	Effective Man Days	Total Ribes	Total Gallons Spray
Open Reproduction	32,646	25,588	742	58,976	87,036	18,839,397	
Dense Reproduction	4,310	2,116		6,426	5,241	749,369	
Open Pole	17,526	15,612	577	33,715	23,909	4,244,736	
Dense Pole	1,287	2,582	92	3,961	1,295	192,271	
Open Mature	15,325	11,346	1,445	28,116	20,462	3,394,869	
Dense Mature	982	492		1,474	474	67,685	
Cut Over	900	11,189	266	12,355	12,056	3,667,690	
Brush	839	300		1,139	2,130	391,550	
Burn	276	240		516	499	77,383	
Subalpine	320	4		324	322	21,447	
Meadow-Field	168	10		178	1	72	
All Upland	74,579	69,479	3,122	147,180	153,425	31,646,469	
Stream (Hand)	2,826	11,631	3,284	17,741	29,757	5,609,148	
Stream (Chemical)	443	2,163	580	3,186	6,564	429,378	143,126
Stream (Machine)	133	87		220	1,598	110,000	
Stream (Zone)	118	3,923		4,041	2,926	425,854	
All Stream	3,077	15,641	3,284	22,002	40,845	6,574,380	
All Types	77,656	85,120	6,406	169,182	194,270	38,220,849	

TABLE NO. 3A - FIRST WORKING

Eradication Type	Acres	Effective Man Days	Total Ribes	Gallons Spray	Per Acre Basis Man Days	Per Acre Basis Ribes	Per Acre Basis Gallons Spray
Open Reproduction	32,646	56,764	14,437,185		1.74	442	
Dense Reproduction	4,310	4,113	605,412		.95	140	
Open Pole	17,526	14,171	2,813,354		.81	161	
Dense Pole	1,287	198	28,245		.15	22	
Open Mature	15,325	12,147	2,319,279		.79	151	
Dense Mature	982	282	44,654		.29	45	
Cut Over	900	1,594	419,681		1.77	466	
Brush	839	1,724	332,087		2.05	396	
Burn	276	321	33,580		1.16	122	
Subalpine	320	320	21,351		1.00	67	
Meadow-Field	168						
All Upland	74,579	91,634	21,054,828		1.23	282	
Stream (Hand)	2,826	9,157	2,199,185		3.24	778	
Stream (Chemical)	443	1,802	180,612	60,204	4.07	408	136
Stream (Machine)	133	1,176	66,500		8.84	500	
Stream (Zone)	118	147	15,402		1.25	131	
All Stream	3,077	12,282	2,461,699		3.99	800	
All Types	77,656	103,916	23,516,527		1.34	303	

TABLE NO. 3B - SECOND WORKING

Eradication Type	Acres	Effective Man Days	Total Ribes	Gallons Spray	Per Acre Basis Man Days	Per Acre Basis Ribes	Per Acre Basis Gallons Spray
Open Reproduction	25,588	29,411	4,343,091		1.15	170	
Dense Reproduction	2,116	1,128	143,957		.53	68	
Open Pole	15,612	9,138	1,328,814		.59	85	
Dense Pole	2,582	1,026	158,951		.40	62	
Open Mature	11,346	7,631	974,763		.67	86	
Dense Mature	492	192	23,031		.39	47	
Cut Over	11,189	9,510	3,134,444		.85	280	
Brush	300	406	59,463		1.35	198	
Burn	240	178	43,803		.74	182	
Subalpine	4	2	96		.50	24	
Meadow-Field	10	1	72		.10	7	
All Upland	69,479	58,623	10,210,485		.84	147	
Stream (Hand)	11,631	16,039	2,469,768		1.38	212	
Stream (Chemical)	2,163	4,486	230,019	76,673	2.07	106	35
Stream (Machine)	87	422	43,500		4.85	500	
Stream (Zone)	3,923	2,779	410,452		.71	105	
All Stream	15,641	23,726	3,153,739		1.51	202	
All Types	85,120	82,349	13,364,224		.97	157	

TABLE NO. 3C - THIRD WORKING

Eradication Type	Acres	Effective Man Days	Total Ribes	Gallons Spray	Per Acre Basis Man Days	Per Acre Basis Ribes	Per Acre Basis Gallons Spray
Open Reproduction	742	861	59,121		1.16	80	
Open Pole	577	600	102,568		1.04	178	
Dense Pole	92	71	5,075		.77	55	
Open Mature	1,445	684	100,827		.47	70	
Cut Over	266	952	113,565		3.58	427	
All Upland	3,122	3,168	381,156		1.01	122	
Stream (Hand)	3,284	4,561	940,195		1.39	286	
Stream (Chemical)	580	276	18,747	6,249	.48	32	11
All Stream	3,284	4,837	958,942		1.47	292	
All Types	6,406	8,005	1,340,098		1.25	209	

TABLE NO. 4

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1938
INLAND EMPIRE

State	Working	Class	Acres	Effective Man Days	Total Ribes	Gallons Spray	Per Acre Basis Man Days	Per Acre Basis Ribes
Idaho	First	EQ-ERA	17,446	21,698	5,778,225		1.24	331
		FS-ERA	4,045	5,480	688,081		1.35	170
		FS-Reg.	19,618	20,395	6,278,392	54,144	1.04	320
		FS-Bulldozer	133	1,176	66,500		8.84	500
		Cooperative	6,794	2,933	370,846		.43	55
		F-CCC	14,688	28,985	4,956,014	1,225	1.97	337
		Total	62,724	80,667	18,138,058	55,369	1.29	289
	Second	EQ-ERA	33,621	27,254	6,205,837	45,034	.81	185
		FS-ERA	6,090	4,137	491,452	2,044	.68	81
		FS-Reg.	15,034	10,516	1,606,930	15,067	.70	107
		FS-Bulldozer	87	422	43,500		4.85	500
		Cooperative	364	264	12,504		.73	34
		F-CCC	17,811	26,640	2,772,790	6,292	1.50	156
		S-CCC	5,923	5,792	1,255,772	7,336	.98	212
		Total	78,930	75,025	12,388,785	75,773	.95	157
	Third	EQ-ERA	847	1,037	307,819	3,025	1.22	363
		FS-ERA	176	186	36,187	348	1.06	206
		FS-Reg.	3,500	3,474	654,928	2,365	.99	187
		F-CCC	1,883	3,308	341,164	511	1.76	181
		Total	6,406	8,005	1,340,098	6,249	1.25	209
	All Workings	EQ-ERA	51,914	49,989	12,291,881	48,059	.96	237
		FS-ERA	10,311	9,803	1,215,720	2,392	.95	118
		FS-Reg.	38,152	34,385	8,540,250	71,576	.90	224
		FS-Bulldozer	220	1,598	110,000		7.26	500
		Cooperative	7,158	3,197	383,350		.45	54
		F-CCC	34,382	58,933	8,069,968	8,028	1.71	235
		S-CCC	5,923	5,792	1,255,772	7,336	.98	212
		Total	148,060	163,697	31,866,941	137,391	1.11	215
Washington	First	EQ-ERA	1,546	6,552	2,610,105		4.24	1,688
		FS-Reg.	371	1,194	597,976		3.22	1,612
		F-CCC	7,810	5,978	958,068		.77	123
		Total	9,727	13,724	4,166,149		1.41	428
	Second	EQ-ERA	3,705	4,264	771,724		1.15	208
		F-CCC	1,082	1,451	67,202		1.34	62
		Total	4,787	5,715	838,926		1.19	175
	All Workings	EQ-ERA	5,251	10,816	3,381,829		2.06	644
		FS-Reg.	371	1,194	597,976		3.22	1,612
		F-CCC	8,892	7,429	1,025,270		.84	115
		Total	14,514	19,439	5,005,075		1.34	345
Montana	First	FS-ERA	2,909	4,696	649,573	2,055	1.61	223
		FS-Reg.	948	1,948	317,051		2.05	334
		F-CCC	1,348	2,881	245,696	2,780	2.14	182
		Total	5,205	9,525	1,212,320	4,835	1.83	233
	Second	FS-ERA	1,190	1,441	120,392	900	1.21	101
		FS-Reg.	114	89	12,486		.78	110
		F-CCC	99	79	3,635		.80	37
		Total	1,403	1,609	136,513	900	1.15	97
	All Workings	FS-ERA	4,099	6,137	769,965	2,955	1.50	188
		FS-Reg.	1,062	2,037	329,537		1.92	310
		F-CCC	1,447	2,960	249,331	2,780	2.05	172
		Total	6,608	11,134	1,348,833	5,735	1.68	204
Total	First	EQ-ERA	18,992	28,250	8,388,330		1.49	442
		FS-ERA	6,954	10,176	1,337,654	2,055	1.46	192
		FS-Reg.	20,937	23,537	7,193,419	54,144	1.12	344
		FS-Bulldozer	133	1,176	66,500		8.84	500
		Cooperative	6,794	2,933	370,846		.43	55
		F-CCC	23,846	37,844	6,159,778	4,005	1.59	258
		Total	77,656	103,916	23,516,527	60,204	1.34	303
	Second	EQ-ERA	37,326	31,518	6,977,561	45,034	.84	187
		FS-ERA	7,280	5,578	611,844	2,944	.77	84
		FS-Reg.	15,148	10,605	1,619,416	15,067	.70	107
		FS-Bulldozer	87	422	43,500		4.85	500
		Cooperative	364	264	12,504		.73	34
		F-CCC	18,992	28,170	2,843,627	6,292	1.48	150
		S-CCC	5,923	5,792	1,255,772	7,336	.98	212
		Total	85,120	82,349	13,364,224	76,673	.97	157
	Third	EQ-ERA	847	1,037	307,819	3,025	1.22	363
		FS-ERA	176	186	36,187	348	1.06	206
		FS-Reg.	3,500	3,474	654,928	2,365	.99	187
		F-CCC	1,883	3,308	341,164	511	1.76	181
		Total	6,406	8,005	1,340,098	6,249	1.25	209
	All Workings	EQ-ERA	57,165	60,805	15,673,710	48,059	1.06	274
		FS-ERA	14,410	15,940	1,985,685	5,347	1.11	138
		FS-Reg.	39,585	37,616	9,467,763	71,576	.95	239
		FS-Bulldozer	220	1,598	110,000		7.26	500
		Cooperative	7,158	3,197	383,350		.45	54
		F-CCC	44,721	69,322	9,344,569	10,808	1.55	209
		S-CCC	5,923	5,792	1,255,772	7,336	.98	212
		Total	169,162	194,270	38,220,849	143,126	1.15	226

TABLE NO. 5

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1938
INLAND EMPIRE

		Number of Acres Worked															
		By Forest Service					By Bureau of Entomology and Plant Quarantine					Total					
		Federal					Federal					Federal					
State	Working	Forest Service	Public Domain	Total	State	Private	Forest Service	Public Domain	Total	State	Private	Forest Service	Public Domain	Total	State	Private	Total
Idaho	First	30,935	80	31,015	167	7,243	4,971		4,971	10,734	8,594	35,906	80	35,986	10,901	15,837	62,724
	Second	29,067	468	29,535	1,839	7,648	9,827	1,281	11,108	10,530	18,270	38,894	1,749	40,643	12,369	25,918	78,930
	Third	3,712	12	3,724	149	1,686	644	32	676		171	4,356	44	4,400	149	1,857	6,406
	Total	63,714	560	64,274	2,155	16,577	15,442	1,313	16,755	21,264	27,035	79,156	1,873	81,029	23,419	43,612	148,060
Washington	First	7,232		7,232	640	306	175	36	211	80	1,258	7,407	36	7,443	720	1,564	9,727
	Second	880		880		200	446	60	506	352	2,849	1,326	60	1,386	352	3,049	4,787
	Total	8,112		8,112	640	506	621	96	717	432	4,107	8,733	96	8,829	1,072	4,613	14,514
Montana	First	4,282		4,282		923						4,282		4,282		923	5,205
	Second	915		915		488						915		915		488	1,403
	Total	5,197		5,197		1,411						5,197		5,197		1,411	6,608
Total	First	42,449	80	42,529	807	8,472	5,146	36	5,182	10,814	9,852	47,595	116	47,711	11,621	18,324	77,656
	Second	30,862	468	31,330	1,839	8,336	10,273	1,341	11,614	10,882	21,119	41,135	1,809	42,944	12,721	29,455	85,120
	Third	3,712	12	3,724	149	1,686	644	32	676		171	4,356	44	4,400	149	1,857	6,406
	Total	77,023	560	77,583	2,795	18,494	16,063	1,409	17,472	21,696	31,142	93,086	1,969	95,055	24,491	49,636	169,182

TABLE NO. 6

TOTAL RIBES BY SPECIES ERADICATED, 1938
INLAND EMPIRE

			Ribes by Species						
Working	Eradication Type	Acres	Ribes lacustre	Ribes viscosissimum	Ribes petiolare	Ribes inerme	Ribes irriguum	Ribes triste	Total Ribes
First	Open Reproduction	32,646	3,628,589	10,765,848	1,465	22,695	18,588		14,437,185
	Dense Reproduction	4,310	354,018	251,284			110		605,412
	Open Pole	17,526	1,349,755	1,448,868	225	2,432	12,074		2,813,354
	Dense Pole	1,287	11,577	16,668					28,245
	Open Mature	15,325	1,574,832	683,961	1,317	547	58,622		2,319,279
	Dense Mature	982	24,990	19,664					44,654
	Cut Over	900	93,545	325,989		80	67		419,681
	Brush	839	108,966	222,450			671		332,087
	Burn	276	33,174	406					33,580
	Subalpine	320	21,351						21,351
	Meadow-Field	168							
	All Upland	74,579	7,200,797	13,735,138	3,007	25,754	90,132		21,054,828
	Stream	3,077	1,765,941	109,403	208,683	356,830	18,098	2,744	2,461,699
	All Types	77,656	8,966,738	13,844,541	211,690	382,584	108,230	2,744	23,516,527
Second	Open Reproduction	25,588	1,694,184	2,609,573	27,190	8,734	3,410		4,343,091
	Dense Reproduction	2,116	72,795	71,162					143,957
	Open Pole	15,612	630,467	689,522	8,003	7	815		1,328,814
	Dense Pole	2,582	129,653	25,922	3,376				158,951
	Open Mature	11,346	481,128	488,765	2,425	37	2,141	267	974,763
	Dense Mature	492	13,138	9,668			225		23,031
	Cut Over	11,189	625,090	2,485,205	12,636	2,979	8,534		3,134,444
	Brush	300	33,397	26,066					59,463
	Burn	240	16,348	22,008	5,447				43,803
	Subalpine	4	12	84					96
	Meadow-Field	10	72						72
	All Upland	69,479	3,696,284	6,427,975	59,077	11,757	15,125	267	10,210,485
	Stream	15,641	1,763,937	428,307	582,838	216,023	15,143	147,491	3,153,739
	All Types	85,120	5,460,221	6,856,282	641,915	227,780	30,268	147,758	13,364,224
Third	Open Reproduction	742	49,918	9,203					59,121
	Open Pole	577	91,845	10,723					102,568
	Dense Pole	92	5,075						5,075
	Open Mature	1,445	86,783	14,044					100,827
	Cut Over	266	80,383	33,182					113,565
	All Upland	3,122	314,004	67,152					381,156
	Stream	3,284	421,037	9,441	264,741	263,723			958,942
	All Types	6,406	735,041	76,593	264,741	263,723			1,340,098
All Workings	Open Reproduction	58,976	5,372,691	13,384,624	28,655	31,429	21,998		18,839,397
	Dense Reproduction	6,426	426,813	322,446			110		749,369
	Open Pole	33,715	2,072,067	2,149,113	8,228	2,439	12,889		4,244,736
	Dense Pole	3,961	146,305	42,590	3,376				192,271
	Open Mature	28,116	2,142,743	1,186,770	3,742	584	60,763	267	3,394,869
	Dense Mature	1,474	38,128	29,332			225		67,685
	Cut Over	12,355	799,018	2,844,376	12,636	3,059	8,601		3,667,690
	Brush	1,139	142,363	248,516			671		391,550
	Burn	516	49,522	22,414	5,447				77,383
	Subalpine	324	21,363	84					21,447
	Meadow-Field	178	72						72
	All Upland	147,180	11,211,085	20,230,265	62,084	37,511	105,257	267	31,646,469
	Stream	22,002	3,950,915	547,151	1,056,262	836,576	33,241	150,235	6,574,380
	All Types	169,182	15,162,000	20,777,416	1,118,346	874,087	138,498	150,502	38,220,849

TABLE NO. 7 - SUMMARY OF ALL WORKINGS

Eradication Type	Acres First Working	Acres Second Working	Acres Third Working	Total Acres	Effective Man Days	Total Ribes	Gallons Spray
Open Reproduction	442,191	48,522	954	491,667	575,505	161,288,183	
Dense Reproduction	93,044	4,807		97,851	42,885	6,306,519	
Open Pole	259,969	32,145	668	292,782	133,223	25,007,496	
Dense Pole	68,610	4,620	104	73,334	15,980	2,538,394	
Open Mature	646,773	32,300	1,454	680,527	312,362	67,735,554	
Dense Mature	67,887	1,587		69,474	8,623	1,175,321	
Cut Over	45,048	21,065	314	66,427	61,885	20,276,908	
Brush	24,059	2,081	15	26,155	25,948	4,995,131	
Burn	10,135	240		10,375	7,349	3,458,741	
Subalpine	3,255	222		3,477	2,307	472,724	
Meadow-Field	2,569	10		2,579	152	12,203	
All Upland	1,663,540	147,599	3,509	1,814,648	1,186,219	293,267,174	
Stream (Hand)	114,716	39,125	7,798	161,639	263,570	64,100,120	
Stream (Chemical)	21,963	8,318	741	31,022	64,803	5,175,740	1,694,375
Stream (Slash)	1,578	53	40	1,671	19,489	1,008,814	
Stream (Machine)	2,010	102		2,112	11,768	1,152,576	
Stream (Zone)	118	3,923		4,041	2,926	425,854	
All Stream	118,817	43,482	7,798	170,097	362,556	71,863,104	
All Types	1,782,357	191,081	11,307	1,984,745	1,548,775	365,130,278	

TABLE NO. 7A - FIRST WORKING

Eradication Type	Acres	Effective Man Days	Total Ribes	Gallons Spray	Per Acre Basis Man Days	Per Acre Basis Ribes	Per Acre Basis Gallons Spray
Open Reproduction	442,191	523,820	153,531,736		1.18	347	
Dense Reproduction	93,044	40,222	6,011,500		.43	65	
Open Pole	259,969	116,051	22,639,113		.45	87	
Dense Pole	68,610	14,327	2,327,692		.21	34	
Open Mature	646,773	293,587	65,115,904		.45	101	
Dense Mature	67,887	8,027	1,109,036		.12	16	
Cut Over	45,048	42,652	15,321,745		.95	340	
Brush	24,059	23,931	4,779,621		.99	199	
Burn	10,135	7,171	3,414,938		.71	337	
Subalpine	3,255	2,170	463,787		.67	142	
Meadow-Field	2,569	151	12,131		.06	5	
All Upland	1,663,540	1,072,109	274,727,203		.64	165	
Stream (Hand)	114,716	205,399	54,246,552		1.79	473	
Stream(Chemical)	21,963	52,350	4,484,052	1,463,749	2.38	204	67
Stream (Slash)	1,578	18,051	971,517		11.44	616	
Stream (Machine)	2,010	11,310	1,106,076		5.63	550	
Stream (Zone)	118	147	15,402		1.25	131	
All Stream	118,817	287,257	60,823,599		2.42	512	
All Types	1,782,357	1,359,366	335,550,802		.76	188	

TABLE NO. 7B - SECOND WORKING

Eradication Type	Acres	Effective Man Days	Total Ribes	Gallons Spray	Per Acre Basis Man Days	Per Acre Basis Ribes	Per Acre Basis Gallons Spray
Open Reproduction	48,522	50,378	7,634,914		1.04	157	
Dense Reproduction	4,807	2,663	295,019		.55	61	
Open Pole	32,145	16,458	2,258,984		.51	70	
Dense Pole	4,620	1,578	205,567		.34	44	
Open Mature	32,300	18,084	2,518,669		.56	78	
Dense Mature	1,587	596	66,285		.38	42	
Cut Over	21,065	18,238	4,829,145		.87	229	
Brush	2,081	2,000	215,072		.96	103	
Burn	240	178	43,803		.74	183	
Subalpine	222	137	8,937		.62	40	
Meadow-Field	10	1	72		.10	7	
All Upland	147,599	110,311	18,076,467		.75	122	
Stream (Hand)	39,125	48,480	8,272,413		1.24	211	
Stream (Chemical)	8,318	11,908	653,684	217,958	1.43	79	26
Stream (Slash	53	796	17,294		15.02	326	
Stream (Machine)	102	458	46,500		4.49	456	
Stream (Zone)	3,923	2,779	410,452		.71	105	
All Stream	43,482	64,421	9,400,343		1.48	216	
All Types	191,081	174,732	27,476,810		.91	144	

TABLE NO. 7C - THIRD WORKING

Eradication Type	Acres	Effective Man Days	Total Ribes	Gallons Spray	Per Acre Basis Man Days	Per Acre Basis Ribes	Per Acre Basis Gallons Spray
Open Reproduction	954	1,307	121,533		1.37	127	
Open Pole	668	714	109,399		1.07	164	
Dense Pole	104	75	5,135		.72	49	
Open Mature	1,454	691	100,981		.48	69	
Cut Over	314	995	126,018		3.17	401	
Brush	15	17	438		1.13	29	
All Upland	3,509	3,799	463,504		1.08	132	
Stream (Hand)	7,798	9,691	1,581,158		1.24	203	
Stream (Chemical)	741	545	38,004	12,628	.74	51	17
Stream (Slash)	40	642	20,000		16.05	500	
All Stream	7,798	10,878	1,639,162		1.39	210	
All Types	11,307	14,677	2,102,666		1.30	186	

TABLE NO. 8

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS 1923-1938
INLAND EMPIRE

State	Working	Class	Acres	Effective Man Days	Total Ribes	Gallons Spray	Per Acre Basis	
							Man Days	Ribes
Idaho	First	EQ-Reg.	44,572	15,195	3,913,072		.34	88
		FS-Reg.	125,180	126,590	36,226,070	272,964	1.01	289
		EQ-NIRA	61,375	37,916	13,414,672	24,200	.62	219
		FS-NIRA	270,392	160,637	47,282,380	113,170	.59	175
		EQ-ERA	320,341	225,168	57,240,623	118,716	.70	179
		FS-ERA	28,793	27,742	6,001,902		.96	208
		Cooperative	214,243	101,203	30,182,930	339,769	.47	141
		F-CCC	342,578	392,945	80,330,829	306,192	1.15	234
		S&P-CCC	166,813	127,659	26,122,385	234,341	.77	157
		Total	1,574,287	1,215,075	300,714,863	1,409,352	.77	191
	Second	FS-Reg.	35,381	25,460	4,677,519	38,872	.72	132
		EQ-NIRA	2,816	1,888	451,021	3,355	.67	160
		FS-NIRA	16,342	7,262	966,499	8,007	.44	59
		EQ-ERA	59,259	45,419	9,212,901	50,648	.77	155
		FS-ERA	10,530	7,813	949,782	2,044	.74	90
		Cooperative	5,943	3,582	636,763	13,227	.60	107
		F-CCC	32,765	52,896	5,931,088	45,689	1.61	181
		S&P-CCC	12,357	13,496	2,119,034	51,086	1.09	171
		Total	175,395	157,816	24,944,607	212,928	.90	142
	Third	FS-Reg.	3,946	3,822	686,471	2,365	.97	174
		FS-NIRA	914	747	127,700	1,922	.82	140
		EQ-ERA	981	1,307	341,204	3,025	1.33	348
		FS-ERA	284	319	44,201	348	1.12	156
		F-CCC	3,191	5,688	729,441	5,008	1.78	229
		S&P-CCC	366	162	17,305		.44	47
		Total	9,682	12,045	1,946,322	12,668	1.24	201
	All Workings	EQ-Reg.	44,572	15,195	3,913,072		.34	88
		FS-Reg.	164,507	155,872	41,590,060	314,201	.95	253
		EQ-NIRA	64,193	39,804	13,865,693	27,555	.62	216
		FS-NIRA	287,648	168,646	48,376,579	123,099	.59	168
		EQ-ERA	380,581	271,914	66,794,728	172,389	.71	176
		FS-ERA	39,607	35,874	6,995,885	2,392	.91	177
		Cooperative	220,186	104,785	30,819,693	352,996	.48	140
		F-CCC	378,534	451,529	86,991,358	356,889	1.19	230
		S&P-CCC	179,536	141,317	28,258,724	285,427	.79	157
		Total	1,759,364	1,384,936	327,605,792	1,634,948	.79	186
Washington	First	FS-Reg.	584	2,237	704,476		3.83	1,206
		EQ-NIRA	26,733	11,711	4,348,258		.44	163
		FS-NIRA	34,417	12,708	3,858,496		.37	112
		EQ-ERA	21,016	33,972	9,716,320		1.62	462
		F-CCC	17,759	16,480	2,445,981		.93	138
		Total	100,509	77,108	21,073,531		.77	210
	Second	EQ-ERA	9,101	9,429	1,581,758		1.04	174
		FS-ERA	1,949	1,678	154,764		.86	79
		F-CCC	1,082	1,451	67,202		1.34	62
		Total	12,132	12,558	1,803,724		1.04	149
	Third	EQ-ERA	238	182	34,147		.76	143
	All Workings	FS-Reg.	584	2,237	704,476		3.83	1,206
		EQ-NIRA	26,733	11,711	4,348,258		.44	163
		FS-NIRA	34,417	12,708	3,858,496		.37	112
		EQ-ERA	30,355	43,583	11,332,225		1.44	373
		FS-ERA	1,949	1,678	154,764		.86	79
		F-CCC	18,841	17,931	2,513,183		.95	133
		Total	112,879	89,848	22,911,402		.80	203
Montana	First	EQ-Reg.	1,383	2,315	462,300	30,665	1.67	334
		FS-Reg.	3,573	2,935	623,129		.82	174
		EQ-NIRA	21,773	8,027	2,158,067		.37	99
		FS-NIRA	22,215	16,789	4,684,242	10,417	.76	211
		EQ-ERA	42,313	20,386	3,292,671	1,330	.48	78
		FS-ERA	4,708	8,393	1,455,235	9,205	1.78	309
		F-CCC	11,596	8,338	1,086,764	2,780	.72	94
		Total	107,561	67,183	13,762,408	54,397	.62	128
	Second	EQ-Reg.	619	980	299,410	4,130	1.58	484
		FS-Reg.	304	261	39,405		.86	130
		EQ-ERA	1,342	1,597	265,637		1.19	198
		FS-ERA	1,190	1,441	120,392	900	1.21	101
		F-CCC	99	79	3,635		.80	37
		Total	3,554	4,358	728,479	5,030	1.23	205
	Third	FS-Reg.	739	1,673	63,157		2.26	85
		EQ-ERA	648	777	59,040		1.20	91
		Total	1,387	2,450	122,197		1.77	88
	All Workings	EQ-Reg.	2,002	3,295	761,710	34,796	1.65	380
		FS-Reg.	4,616	4,869	725,691		1.05	157
		EQ-NIRA	21,773	8,027	2,158,067		.37	99
		FS-NIRA	22,215	16,789	4,684,242	10,417	.76	211
		EQ-ERA	44,303	22,760	3,617,348	1,330	.51	82
		FS-ERA	5,898	9,834	1,575,627	10,105	1.67	267
		F-CCC	11,695	8,417	1,090,399	2,780	.72	93
		Total	112,502	73,991	14,613,084	59,427	.66	130
Idaho Washington Montana	First	EQ-Reg.	45,965	17,510	4,375,372	30,665	.38	95
		FS-Reg.	129,337	131,762	37,653,675	272,964	1.02	290
		EQ-NIRA	109,861	57,654	19,920,997	24,200	.52	181
		FS-NIRA	327,024	190,134	55,825,118	123,587	.58	171
		EQ-ERA	383,670	279,546	70,249,614	120,046	.73	183
		FS-ERA	33,501	36,135	7,457,137	9,205	1.08	223
		Cooperative	214,243	101,203	30,182,930	339,769	.47	141
		F-CCC	371,933	417,763	83,863,574	308,972	1.12	225
		S&P-CCC	166,813	127,659	26,122,385	234,341	.77	157
		Total	1,782,357	1,359,366	335,550,802	1,463,749	.76	188
	Second	EQ-Reg.	619	980	299,410	4,130	1.58	484
		FS-Reg.	35,685	25,721	4,716,924	38,872	.72	132
		EQ-NIRA	2,818	1,888	451,021	3,355	.67	160
		FS-NIRA	16,342	7,262	966,499	8,007	.44	69
		EQ-ERA	69,702	56,445	11,060,296	50,648	.81	159
		FS-ERA	13,669	10,932	1,224,938	2,944	.80	90
		Cooperative	5,943	3,582	636,763	13,227	.60	107
		F-CCC	33,946	64,426	6,001,925	45,689	1.60	177
		S&P-CCC	12,357	13,496	2,119,034	51,086	1.09	171
		Total	191,081	174,732	27,476,810	217,958	.91	144
	Third	FS-Reg.	4,685	5,495	749,628	2,365	1.17	160
		FS-NIRA	914	747	127,700	1,922	.82	140
		EQ-ERA	1,867	2,266	434,391	3,025	1.21	233
		FS-ERA	284	319	44,201	348	1.12	156
		F-CCC	3,191	5,688	729,441	5,008	1.78	229
		S&P-CCC	366	162	17,305		.44	47
		Total	11,307	14,677	2,102,666	12,668	1.30	186
	All Workings	EQ-Reg.	46,574	18,490	4,674,782	34,795	.40	100
		FS-Reg.	169,707	162,978	43,020,227	314,201	.96	253
		EQ-NIRA	112,699	59,542	20,372,018	27,555	.53	181
		FS-NIRA	344,280	198,143	56,919,317	133,516	.58	165
		EQ-ERA	455,239	338,257	81,744,301	173,719	.74	180
		FS-ERA	47,454	47,386	8,726,276	12,497	1.00	184
		Cooperative	220,166	104,785	30,819,693	352,996	.48	140
		F-CCC	409,070	477,877	90,594,940	359,669	1.17	221
		S&P-CCC	179,536	141,317	28,258,724	285,427	.79	157
		Total	1,984,745	1,548,775	365,130,278	1,694,375	.78	184

TABLE NO. 9

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1923-1938
INLAND EMPIRE

State	Working	Number of Acres Worked by Ownership Classes					Total
		Federal					
		Forest Service	Public Domain	Total	State	Private	
Idaho	First	830,312	15,819	846,131	251,808	476,348	1,574,287
	Second	98,713	2,309	101,022	21,310	53,063	175,395
	Third	6,728	96	6,824	364	2,494	9,682
	Total	935,753	18,224	953,977	273,482	531,905	1,759,364
Washington	First	48,790	315	49,105	6,782	44,622	100,509
	Second	2,762	60	2,822	2,664	6,646	12,132
	Third				153	85	238
	Total	51,552	375	51,927	9,599	51,353	112,879
Montana	First	88,736		88,736	696	18,129	107,561
	Second	2,254		2,254		1,300	3,554
	Third	335		335		1,052	1,387
	Total	91,325		91,325	696	20,481	112,502
Total	First	967,838	16,134	983,972	259,286	539,099	1,782,357
	Second	103,729	2,369	106,098	23,974	61,009	191,081
	Third	7,063	96	7,159	517	3,631	11,307
	Total	1,078,630	18,599	1,097,229	283,777	603,739	1,984,745

TABLE NO. 10

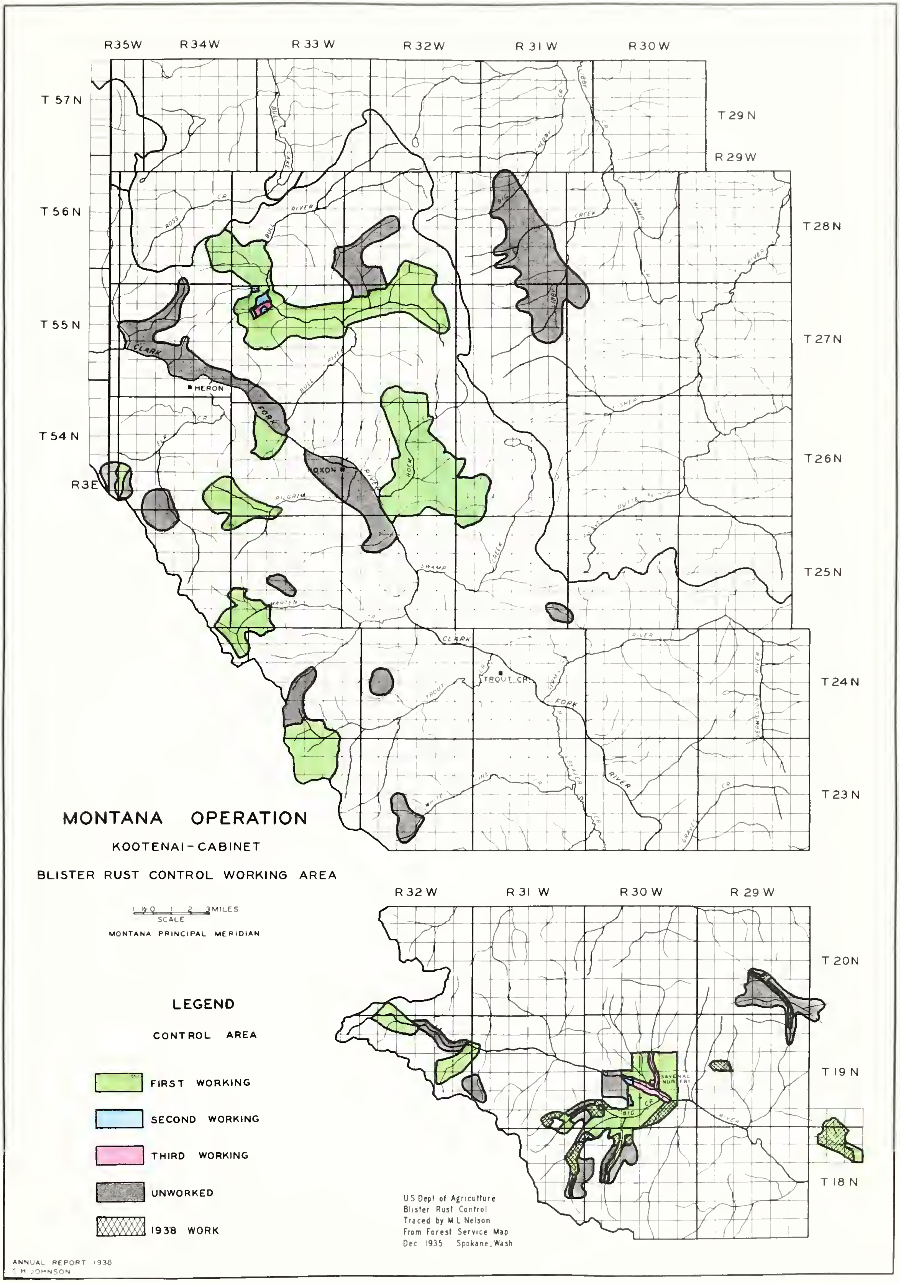
PROGRESS OF FIRST WORKING BY OWNERSHIP CLASSES, 1923-1938
INLAND EMPIRE

State	Ownership Class	Number of Acres		
		Worked	Unworked	Total
Idaho	Forest Service	830,312	301,923	1,132,235
	Public Domain	15,819	15,931	31,750
	Sub-total Federal	846,131	317,854	1,163,985
	State	251,808	93,067	344,875
	Private	476,348	322,207	798,555
	Total	1,574,287	733,128	2,307,415
Washington	Forest Service	48,790	43,100	91,890
	Public Domain	315		315
	Sub-total Federal	49,105	43,100	92,205
	State	6,782	4,033	10,815
	Private	44,622	14,608	59,230
	Total	100,509	61,741	162,250
Montana	Forest Service	88,736	74,789	163,525
	State	696	234	930
	Private	18,129	18,156	36,285
	Total	107,561	93,179	200,740
Total	Forest Service	967,838	419,812	1,387,650
	Public Domain	16,134	15,931	32,065
	Sub-total Federal	983,972	435,743	1,419,715
	State	259,286	97,334	356,620
	Private	539,099	354,971	894,070
	Total	1,782,357	888,048	2,670,405

TABLE NO. 11

TOTAL RIBES BY SPECIES ERADICATED, 1923-1938
INLAND EMPIRE

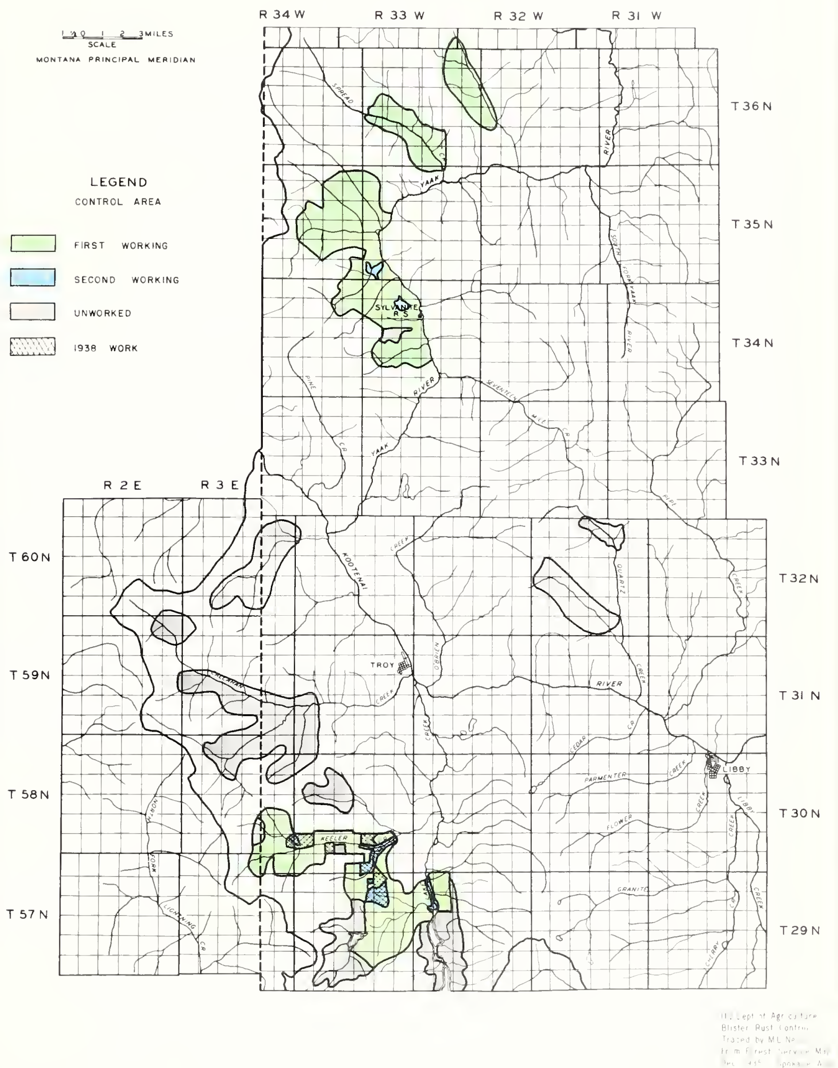
Working	Eradication Type	Acres	Ribes by Species								Total Ribes
			Ribes lacustre	Ribes viscosissimum	Ribes petiolare	Ribes inerme	Ribes irriguum	Ribes coloradense	Ribes triste	Ribes acerifolium	
First	Open Reproduction	442,191	39,532,635	112,299,513	171,672	1,061,219	465,552		1,145		153,531,736
	Dense Reproduction	93,044	3,122,623	2,731,451	15,767	104,631	34,813	2,215			6,011,500
	Open Pole	259,969	11,434,164	10,577,443	62,792	339,069	221,269		462	3,914	22,639,113
	Dense Pole	68,610	1,416,649	862,671	1,651	36,301	10,420				2,327,692
	Open Mature	646,773	42,447,845	21,678,888	224,946	362,995	392,108	7,069	26	2,027	65,115,904
	Dense Mature	67,887	813,178	249,361	1,104	42,382	2,839	172			1,109,036
	Cut Over	45,048	5,166,248	9,984,293	43,873	88,549	38,782				15,321,745
	Brush	24,069	1,513,695	3,128,718	19,257	97,116	20,835				4,779,621
	Burn	10,135	706,582	2,671,736	8,895	18,433	9,292				3,414,938
	Subalpine	3,255	326,851	136,917		19					463,787
	Meadow-Field	2,569	5,010			7,121					12,131
	All Upland	1,663,540	106,485,480	164,320,991	549,957	2,157,835	1,195,910	9,456	1,633	5,941	274,727,203
	Stream	118,817	39,875,081	1,899,058	6,176,697	12,684,147	116,158	31,619	21,255	19,584	60,823,599
	All Types	1,782,357	146,360,561	166,220,049	6,726,654	14,841,982	1,312,068	41,075	22,888	25,525	335,550,802
Second	Open Reproduction	48,522	2,860,919	4,678,577	32,991	46,001	16,426				7,634,914
	Dense Reproduction	4,807	191,086	102,400	4	1,529					295,019
	Open Pole	32,145	1,218,215	1,008,761	16,430	13,842	1,736				2,258,984
	Dense Pole	4,620	163,645	35,785	3,376	2,761					205,567
	Open Mature	32,300	1,355,115	1,124,084	15,799	14,422	8,982		267		2,518,669
	Dense Mature	1,587	53,840	11,562		658	225				66,285
	Cut Over	21,065	1,181,390	3,586,660	30,892	21,669	8,534				4,829,145
	Brush	2,081	65,099	149,098		875					215,072
	Burn	240	16,348	22,008	5,447						43,803
	Subalpine	222	4,831	4,106							8,937
	Meadow-Field	10	72								72
	All Upland	147,599	7,110,560	10,723,041	104,939	101,757	35,903		267		18,076,467
	Stream	43,482	5,162,448	687,325	1,793,117	1,584,494	25,468		147,491		9,400,343
	All Types	191,081	12,273,008	11,410,366	1,898,056	1,686,251	61,371		147,758		27,476,810
Third	Open Reproduction	954	84,612	36,721			200				121,533
	Open Pole	668	93,271	16,122			6				109,399
	Dense Pole	104	5,075	60							5,135
	Open Mature	1,454	86,837	14,144							100,981
	Cut Over	314	88,961	37,057							126,018
	Brush	15	140	298							438
	All Upland	3,509	358,896	104,402			206				463,504
	Stream	7,798	763,913	23,594	431,983	419,672					1,639,162
	All Types	11,307	1,122,809	127,996	431,983	419,672	206				2,102,666
All Workings	Open Reproduction	491,667	42,478,166	117,014,811	204,663	1,107,220	482,178		1,145		161,288,183
	Dense Reproduction	97,851	3,313,709	2,833,851	15,771	106,160	34,813	2,215			6,306,519
	Open Pole	292,782	12,745,650	11,602,326	79,222	352,911	223,011		462	3,914	25,007,496
	Dense Pole	73,334	1,585,369	898,516	5,027	39,062	10,420				2,538,394
	Open Mature	680,527	43,889,797	22,817,116	240,745	377,417	401,090	7,069	293	2,027	67,735,554
	Dense Mature	69,474	867,018	260,923	1,104	43,040	3,064	172			1,175,321
	Cut Over	66,427	6,436,599	13,608,010	74,765	110,218	47,316				20,276,908
	Brush	26,155	1,578,934	3,278,114	19,257	97,991	20,835				4,995,131
	Burn	10,375	722,930	2,693,744	14,342	18,433	9,292				3,458,741
	Subalpine	3,477	331,682	141,023		19					472,724
	Meadow-Field	2,579	5,082			7,121					12,203
	All Upland	1,814,648	113,954,936	175,148,434	654,896	2,259,592	1,232,019	9,456	1,900	5,941	293,267,174
	Stream	170,097	45,801,442	2,609,977	8,401,797	14,688,313	141,626	31,619	168,746	19,584	71,863,104
	All Types	1,984,745	159,756,378	177,758,411	9,056,693	16,947,905	1,373,645	41,075	170,646	25,525	365,130,278


MONTANA OPERATION
KOOTENAI-CABINET
BLISTER RUST CONTROL WORKING AREA
1½ 0 1 2 3 MILES
SCALE
MONTANA PRINCIPAL MERIDIAN
LEGEND
CONTROL AREA
FIRST WORKING
SECOND WORKING
THIRD WORKING
UNWORKED
1938 WORK
R35W R34W R33W R32W R31W R30W R29W
T57N T56N T55N T54N R3E
T29N T28N T27N T26N T25N T24N T23N
R32W R31W R30W R29W
T20N T19N T18N
HERON
NOXON
TROUT CR.
CLARK FORK
SAVENAC NURSERY
U.S. Dept of Agriculture
Blister Rust Control
Traced by M.L. Nelson
From Forest Service Map
Dec 1935 Spokane, Wash
ANNUAL REPORT 1938
C.H. JOHNSON

MONTANA OPERATION

KOOTENAI

BLISTER RUST CONTROL WORKING AREA



ANNUAL REPORT 1938
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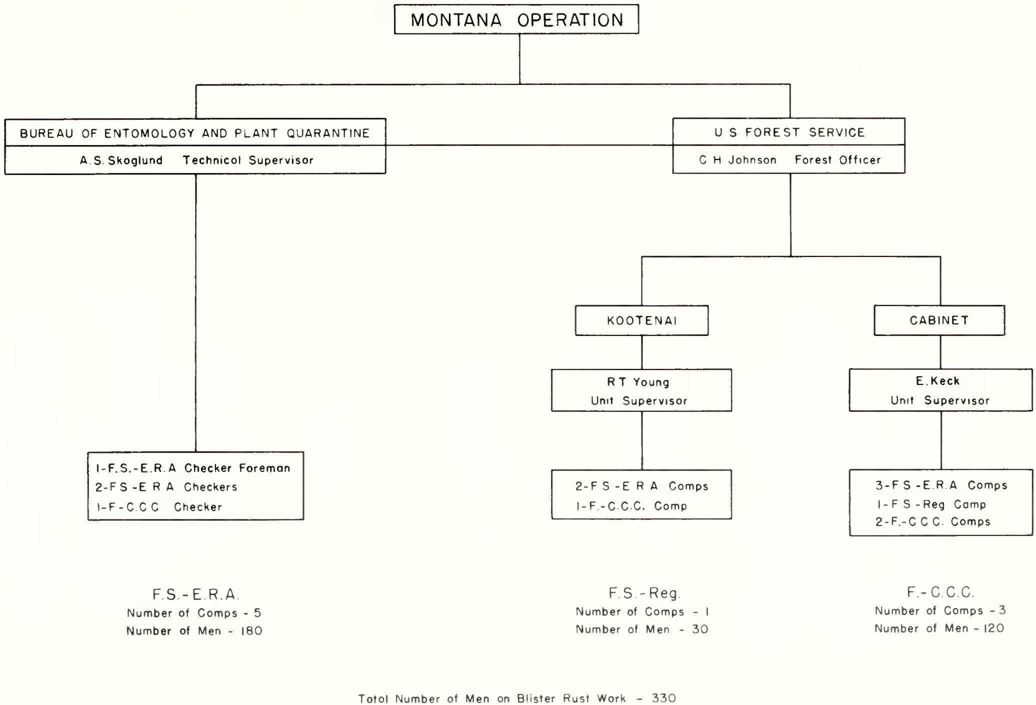
ORGANIZATION CHART



[illegible]

[illegible]

[illegible]

The [illegible]

The Forest Service [illegible] supervisors, assistants and district rangers [illegible] the program successful. The Bureau of Entomology and Plant Quarantine [illegible] in the establishment of camps and direction of the [illegible] Federal forest, and also [illegible] adequate [illegible]

[illegible]

The [illegible] in the case and in addition cooperated with and assisted [illegible] of the [illegible]

There were [illegible] acres [illegible] regular [illegible] per acre.

In addition to the regular [illegible] at a cost of [illegible] per acre. Of this cost [illegible] classified as [illegible] maintenance costs with [illegible] some additional [illegible]

STATEMENT OF EXPENDITURES AND COSTS

The statement of expenditures and costs is shown in the [illegible] tables by the cooperative agency and the type of appropriation.

TABLE NO. [illegible]

EXPENDITURES BY APPROPRIATIONS, CALENDAR YEAR [illegible]

[illegible]

Cooperating Agency	Appropriation	Amount
Forest Service	Regular	[illegible]
	[illegible]	[illegible]
	Total	[illegible]
Bureau of Entomology and Plant Quarantine	Regular	[illegible]
Total Expenditures	All Appropriations	[illegible]

TABLE NO. 3 - SUMMARY OF ALL WORKINGS

Forest	Eradication Type	Acres First Working	Acres Second Working	Total Acres	Total Effective Man Days	Total Ribes	Gallons Spray	Ribes Remaining Per Acre Bushes	Ribes Remaining Per Acre Live Stem
Kootenai	Open Reproduction	118	154	272	380	44,663		4.3	13.4
	Dense Reproduction	208	80	288	234	14,506		.2	1.2
	Open Pole	792	508	1,300	1,642	137,337		2.5	10.9
	Dense Pole	16		16	1				
	Open Mature	138		138	126	11,873		2.1	8.1
	Dense Mature	60		60	33	1,547		.4	.7
	All Upland	1,332	742	2,074	2,416	209,926		2.3	9.6
	Stream (Hand)	42	529	571	981	83,245		11.4	11.5
	All Types	1,374	1,271	2,645	3,397	293,171		6.2	10.4
Cabinet	Open Reproduction	1,929	114	2,043	5,514	795,445		4.5	13.2
	Open Pole	865		865	318	27,521		.4	1.0
	Dense Pole	26		26					
	Open Mature	224		224	59	5,549		.5	3.9
	All Upland	3,044	114	3,158	5,891	828,515		3.1	8.8
	Stream (Hand)	190	18	208	1,347	183,107			
	Stream (Chemical)	71	12	83	288	17,205	5,735		
	All Stream	190	18	208	1,635	200,312		14.3	55.7
	All Types	3,234	132	3,366	7,526	1,028,827		6.0	21.0
Savenac Nursery	Open Reproduction	355		355	3	10			
	Stream (Hand)	242		242	208	26,825		7.6	30.3
	All Types	597		597	211	26,835		2.4	9.4
All Forests	Open Reproduction	2,402	268	2,670	5,897	840,118		3.6	11.4
	Dense Reproduction	208	80	288	234	14,506		.2	1.2
	Open Pole	1,657	508	2,165	1,960	164,858		1.7	7.0
	Dense Pole	42		42	1				
	Open Mature	362		362	185	17,422		1.1	3.5
	Dense Mature	60		60	33	1,547		.4	.7
	All Upland	4,731	856	5,587	8,310	1,038,451		2.6	8.5
	Stream (Hand)	474	547	1,021	2,536	293,177			
	Stream (Chemical)	71	12	83	288	17,205	5,735		
	All Stream	474	547	1,021	2,824	310,382		12.3	30.0
	All Types	5,205	1,403	6,608	11,134	1,348,833		5.9	15.7

TABLE NO. 3A - FIRST WORKING

Forest	Eradication Type	Acres	Effective Man Days	Total Ribes	Gallons Spray	Per Acre Basis Man Days	Per Acre Basis Ribes	Per Acre Basis Gallons Spray	Ribes Remaining Per Acre Bushes	Ribes Remaining Per Acre Live Stem
Kootenai	Open Reproduction	118	232	20,710		1.97	176		6.9	20.1
	Dense Reproduction	208	233	14,439		1.12	69		.3	1.7
	Open Pole	792	1,168	105,956		1.47	134		3.0	13.8
	Dense Pole	16	1			.06				
	Open Mature	138	126	11,873		.91	86		2.0	8.1
	Dense Mature	60	33	1,547		.55	26		.4	.7
	All Upland	1,332	1,793	154,525		1.35	116		2.7	11.4
	Stream (Hand)	42	180	20,615		4.29	491		4.8	11.1
	All Types	1,374	1,973	175,140		1.44	127		3.0	11.1
Cabinet	Open Reproduction	1,929	5,425	782,959		2.81	406		3.5	11.4
	Open Pole	865	318	27,521		.37	32		.4	1.0
	Dense Pole	26								
	Open Mature	224	59	5,549		.26	25		.5	3.9
	All Upland	3,044	5,802	816,029		1.91	268		2.3	7.5
	Stream (Hand)	190	1,286	179,811		6.77	946			
	Stream (Chemical)	71	253	14,505	4,835	3.56	204	68		
	All Stream	190	1,539	194,316		8.10	1,023		14.5	58.0
	All Types	3,234	7,341	1,010,345		2.27	312		5.5	20.6
Savenac Nursery	Open Reproduction	355	3	10		.01	1			
	Stream (Hand)	242	208	26,825		.86	111		7.6	30.3
	All Types	597	211	26,835		.35	45		2.4	9.4
All Forests	Open Reproduction	2,402	5,660	803,679		2.36	335		2.8	10.1
	Dense Reproduction	208	233	14,439		1.12	69		.3	1.7
	Open Pole	1,657	1,486	133,477		.90	81		1.7	7.2
	Dense Pole	42	1			.02				
	Open Mature	362	185	17,422		.51	48		1.1	3.5
	Dense Mature	60	33	1,547		.55	26		.4	.7
	All Upland	4,731	7,598	970,564		1.61	205		2.3	8.0
	Stream (Hand)	474	1,674	227,251		3.53	479			
	Stream (Chemical)	71	253	14,505	4,835	3.56	204	68		
	All Stream	474	1,927	241,756		4.07	510		12.1	46.7
	All Types	5,205	9,525	1,212,320		1.83	233		4.6	17.2

TABLE NO. 3B - SECOND WORKING

Forest	Eradication Type	Acres	Effective Man Days	Total Ribes	Gallons Spray	Per Acre Basis Man Days	Per Acre Basis Ribes	Per Acre Basis Gallons Spray	Ribes Remaining Per Acre Bushes	Ribes Remaining Per Acre Live Stem
Kootenai	Open Reproduction	154	148	23,953		.96	155		2.4	8.7
	Dense Reproduction	80	1	67		.01	1			
	Open Pole	508	474	31,381		.93	62		1.7	6.3
	All Upland	742	623	55,401		.84	75		1.7	6.3
	Stream (Hand)	529	801	62,630		1.51	118		12.7	11.8
	All Types	1,271	1,424	118,031		1.12	93		8.7	9.8
Cabinet	Open Reproduction	114	89	12,486		.78	110		17.7	34.8
	Stream (Hand)	18	61	3,296		3.39	183			
	Stream (Chemical)	12	35	2,700	900	2.92	225	75		
	All Stream	18	96	5,996		5.33	333		11.4	12.8
	All Types	132	185	18,482		1.40	140		16.0	28.9
All Forests	Open Reproduction	268	237	36,439		.88	136		9.9	21.4
	Dense Reproduction	80	1	67		.01	1			
	Open Pole	508	474	31,381		.93	62		1.7	6.3
	All Upland	856	712	67,887		.83	79		4.5	11.2
	Stream (Hand)	547	862	65,926		1.58	121			
	Stream (Chemical)	12	35	2,700	900	2.92	225	75		
	All Stream	547	897	68,626		1.64	125		12.6	11.8
	All Types	1,403	1,609	136,513		1.15	97		9.4	11.6

TABLE NO. 4

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1938
MONTANA OPERATION

Working	Class	Acres	Effective Man Days	Total Ribes	Gallons Spray	Per Acre Basis			Ribes Remaining Per Acre	
						Man Days	Ribes	Gallons Per Sprayed Area	Bushes	Live Stem
First	FS-ERA	2,909	4,696	649,573	2,055	1.61	223	86	4.9	15.8
	FS-Reg.	948	1,948	317,051		2.05	334		3.8	13.1
	F-CCC	1,348	2,881	245,696	2,780	2.14	182	59	4.3	22.6
	Total	5,205	9,525	1,212,320	4,835	1.83	233	68	4.6	17.2
Second	FS-ERA	1,190	1,441	120,392	900	1.21	101	75	13.2	7.5
	FS-Reg.	114	89	12,486		.78	110		5.9	16.3
	F-CCC	99	79	3,635		.80	37		2.5	9.4
	Total	1,403	1,609	136,513	900	1.15	97		9.4	11.6
All Workings	FS-ERA	4,099	6,137	769,965	2,955	1.50	188	82	6.9	13.9
	FS-Reg.	1,062	2,037	329,537		1.92	310		4.9	14.9
	F-CCC	1,447	2,960	249,331	2,780	2.05	172	59	4.2	21.9
	Total	6,608	11,134	1,348,833	5,735	1.68	204	69	5.9	15.7

TABLE NO. 5

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1938
MONTANA OPERATION

Forest	Working	Number of Acres Worked by Forest Service		
		Forest Service	Private	Total
Kootenai	First	1,323	51	1,374
	Second	783	488	1,271
	Total	2,106	539	2,645
Cabinet	First	2,567	667	3,234
	Second	132		132
	Total	2,699	667	3,366
Savenac Nursery	First	392	205	597
All Forests	First	4,282	923	5,205
	Second	915	488	1,403
	Total	5,197	1,411	6,608

TABLE NO. 6

RESULTS OF CHECKING ON AREAS WORKED, 1938
MONTANA OPERATION

Forest	Eradication Type	Average Results for All Areas				Areas with More Than 25 Feet Live Stem Per Acre		
		Acres in Checked Area	Acres Checked	Ribes per Acre			Per Acre	
				Bushes	Live Stem	Acres	Bushes	Live Stem
Kootenai	Open Reproduction	264	10.62	4.3	13.4	61	14.3	43.5
	Dense Reproduction	233	8.84	.2	1.2			
	Open Pole	1,278	52.68	2.5	10.9	125	16.4	66.2
	Dense Pole	16	.64					
	Open Mature	138	5.44	2.1	8.1	23	7.8	33.4
	Dense Mature	60	2.72	.4	.7			
	All Upland	1,989	80.94	2.3	9.6	209	14.9	56.2
	Stream	571	61.18	11.4	11.5	50	5.5	22.4
	All Types	2,560	142.12	6.2	10.4		11.8	45.1
Cabinet	Open Reproduction	1,906	80.46	4.5	13.2	229	20.4	65.2
	Open Pole	865	34.76	.4	1.0			
	Dense Pole	26	.78					
	Open Mature	224	9.32	.5	3.9			
	All Upland	3,021	125.32	3.1	8.8	229	20.4	65.2
	Stream	188	43.84	14.3	55.7	42	33.7	176.3
	All Types	3,209	169.16	6.0	21.0	271	26.9	119.5
Savenac Nursery	Open Reproduction	355	14.20					
	Stream	23	6.44	7.6	30.3	20	8.0	31.0
	All Types	378	20.64	2.4	9.4	20	8.0	31.0
All Forests	Open Reproduction	2,525	105.28	3.6	11.4	290	19.2	60.8
	Dense Reproduction	233	8.84	.2	1.2			
	Open Pole	2,143	87.44	1.7	7.0	125	16.4	66.2
	Dense Pole	16	.64					
	Open Mature	362	14.76	1.1	3.5	23	7.8	33.4
	Dense Mature	60	2.72	.4	.7			
	All Upland	5,365	220.46	2.6	8.5	438	17.7	61.0
	Stream	782	111.46	12.3	30.0	112	19.6	97.8
	All Types	6,147	331.92	5.9	15.7	550	18.7	80.0

TABLE NO. 7

TOTAL RIBES BY SPECIES ERADICATED, 1938
MONTANA OPERATION

Working	Eradication Type	Acres	Ribes by Species						Total Ribes
			Ribes lacustre	Ribes viscosissimum	Ribes petiolare	Ribes inerme	Ribes irriguum	Ribes triste	
First	Open Reproduction	2,402	332,373	461,374	875		9,057		803,679
	Dense Reproduction	208	11,585	2,844			10		14,439
	Open Pole	1,657	90,528	42,949					133,477
	Dense Pole	42							
	Open Mature	362	3,028	14,394					17,422
	Dense Mature	60	1,263	284					1,547
	All Upland	4,731	438,777	521,845	875		9,067		970,564
	Stream	474	196,226	12,442	27,011	3,465		2,612	241,756
	All Types	5,205	635,003	534,287	27,886	3,465	9,067	2,612	1,212,320
Second	Open Reproduction	268	27,982	8,066	267		124		36,439
	Dense Reproduction	80	63	4					67
	Open Pole	508	26,957	4,424					31,381
	All Upland	856	55,002	12,494	267		124		67,887
	Stream	547	48,304	795	2,747	16,780			68,626
	All Types	1,403	103,306	13,289	3,014	16,780	124		136,513
All Workings	Open Reproduction	2,670	360,355	469,440	1,142		9,181		840,118
	Dense Reproduction	288	11,648	2,848			10		14,506
	Open Pole	2,165	117,485	47,373					164,858
	Dense Pole	42							
	Open Mature	362	3,028	14,394					17,422
	Dense Mature	60	1,263	284					1,547
	All Upland	5,587	493,779	534,339	1,142		9,191		1,038,451
	Stream	1,021	244,530	13,237	29,758	20,245		2,612	310,382
	All Types	6,608	738,309	547,576	30,900	20,245	9,191	2,612	1,348,833

SUMMARY OF RIBES ERADICATION, 1928-1938
MONTANA OPERATION

TABLE NO. 8 - SUMMARY OF ALL WORKINGS

Forest	Eradication Type	Acres First Working	Acres Second Working	Acres Third Working	Total Acres	Effective Man Days	Total Ribes	Gallons Spray
Kootenai	Open Reproduction	7,985	261		8,246	4,703	731,932	
	Dense Reproduction	2,750	80		2,830	1,008	135,179	
	Open Pole	12,673	779		13,452	7,023	798,307	
	Dense Pole	3,531			3,531	230	15,607	
	Open Mature	7,469			7,469	3,079	433,335	
	Dense Mature	8,328			8,328	457	48,561	
	Brush	107			107	93	7,952	
	Burn	115			115	1	32	
	Meadow-Field	103			103	1		
	All Upland	43,061	1,120		44,181	16,595	2,170,905	
	Stream (Hand)	2,600	533		3,133	7,511	1,170,301	
	All Types	45,661	1,653		47,314	24,106	3,341,206	
Cabinet	Open Reproduction	21,149	469	99	21,717	17,649	4,090,246	
	Dense Reproduction	1,612			1,612	438	71,747	
	Open Pole	16,618	361	38	17,017	7,629	1,408,374	
	Dense Pole	2,619	153	12	2,784	966	211,681	
	Open Mature	7,035			7,035	3,265	888,520	
	Dense Mature	557			557	88	8,566	
	Brush	2,763			2,763	1,895	573,939	
	Meadow-Field	348			348	150	12,131	
	All Upland	52,701	983	149	53,833	32,080	7,265,204	
	Stream (Hand)	3,470	149		3,619	9,347	2,561,756	
	Stream (Chemical)	392	12		404	1,055	69,906	23,302
	Stream (Slash)	23			23	215	11,500	
	Stream (Machine)	75			75	644	39,500	
	All Stream	3,568	149		3,717	11,261	2,682,662	
	All Types	56,269	1,132	149	57,550	43,341	9,947,866	
Savenac Nursery	Open Reproduction	4,540	135		4,675	880	365,573	
	Dense Reproduction	102			102	3		
	All Upland	4,642	135		4,777	883	365,573	
	Stream (Hand)	989	619	1,238	2,846	3,940	712,549	
	Stream (Chemical)	237	62		299	875	200,390	36,125
	Stream (Slash)	45		40	85	810	42,500	
	Stream (Machine)		15		15	36	3,000	
	All Stream	989	634	1,238	2,861	5,661	958,439	
	All Types	5,631	769	1,238	7,638	6,544	1,324,012	
All Forests	Open Reproduction	33,674	865	99	34,638	23,232	5,187,751	
	Dense Reproduction	4,464	80		4,544	1,449	206,926	
	Open Pole	29,291	1,140	38	30,469	14,652	2,206,681	
	Dense Pole	6,150	153	12	6,315	1,196	227,288	
	Open Mature	14,504			14,504	6,344	1,321,855	
	Dense Mature	8,885			8,885	545	57,127	
	Brush	2,870			2,870	1,988	581,891	
	Burn	115			115	1	32	
	Meadow-Field	451			451	151	12,131	
	All Upland	100,404	2,238	149	102,791	49,558	9,801,682	
	Stream (Hand)	7,059	1,301	1,238	9,598	20,798	4,444,606	
	Stream (Chemical)	629	74		703	1,930	270,296	59,427
	Stream (Slash)	68		40	108	1,025	54,000	
	Stream (Machine)	75	15		90	680	42,500	
	All Stream	7,157	1,316	1,238	9,711	24,433	4,811,402	
	All Types	107,561	3,554	1,387	112,502	73,991	14,613,084	

TABLE NO. 8A - FIRST WORKING

Forest	Eradication Type	Acres	Effective Man Days	Total Ribes	Gallons Spray	Per Acre Basis Man Days	Per Acre Basis Ribes	Per Acre Basis Gallons Spray
Kootenai	Open Reproduction	7,985	4,539	706,477		.67	88	
	Dense Reproduction	2,750	1,007	135,112		.37	49	
	Open Pole	12,673	6,416	757,817		.51	60	
	Dense Pole	3,531	230	15,607		.07	4	
	Open Mature	7,469	3,079	433,335		.41	58	
	Dense Mature	8,328	457	48,561		.05	6	
	Brush	107	93	7,952		.87	74	
	Burn	115	1	32		.01	1	
	Meadow-Field	103	1			.01		
	All Upland	43,061	15,823	2,104,893		.37	49	
	Stream (Hand)	2,600	6,706	1,107,426		2.58	426	
	All Types	45,661	22,529	3,212,319		.49	70	
Cabinet	Open Reproduction	21,149	16,369	3,837,079		.77	181	
	Dense Reproduction	1,612	438	71,747		.27	45	
	Open Pole	16,618	7,261	1,376,062		.44	83	
	Dense Pole	2,619	901	208,827		.34	80	
	Open Mature	7,035	3,265	888,520		.46	126	
	Dense Mature	557	88	8,566		.16	15	
	Brush	2,763	1,895	573,939		.69	208	
	Meadow-Field	348	150	12,131		.43	35	
	All Upland	52,701	30,367	6,975,871		.58	132	
	Stream (Hand)	3,470	9,045	2,541,086		2.61	732	
	Stream (Chemical)	392	1,020	67,206	22,402	2.60	171	57
	Stream (Slash)	23	215	11,500		9.35	500	
	Stream (Machine)	75	644	39,500		8.59	527	
	All Stream	3,568	10,924	2,659,292		3.06	745	
	All Types	56,269	41,291	9,635,163		.73	171	
Savenac Nursery	Open Reproduction	4,540	716	332,893		.16	73	
	Dense Reproduction	102	3			.03		
	All Upland	4,642	719	332,893		.15	72	
	Stream (Hand)	989	1,704	371,543		1.72	376	
	Stream (Chemical)	237	772	187,990	31,995	3.26	793	135
	Stream (Slash)	45	168	22,500		3.73	500	
	All Stream	989	2,644	582,033		2.67	589	
	All Types	5,631	3,363	914,926		.60	162	
All Forests	Open Reproduction	33,674	21,624	4,876,449		.64	145	
	Dense Reproduction	4,464	1,448	206,859		.32	46	
	Open Pole	29,291	13,677	2,132,879		.47	73	
	Dense Pole	6,150	1,131	224,434		.18	36	
	Open Mature	14,504	6,344	1,321,855		.44	91	
	Dense Mature	8,885	545	67,127		.06	6	
	Brush	2,870	1,988	581,891		.69	203	
	Burn	115	1	32		.01	1	
	Meadow-Field	451	151	12,131		.33	27	
	All Upland	100,404	46,909	9,413,657		.47	94	
	Stream (Hand)	7,059	17,456	4,020,055		2.47	569	
	Stream (Chemical)	629	1,792	255,196	54,397	2.85	406	86
	Stream (Slash)	68	383	34,000		5.63	500	
	Stream (Machine)	75	644	39,500		8.59	527	
	All Stream	7,157	20,274	4,348,751		2.83	608	
	All Types	107,561	67,183	13,762,408		.62	128	

TABLE NO. 8B - SECOND WORKING

Forest	Eradication Type	Acres	Effective Man Days	Total Ribes	Gallons Spray	Per Acre Basis Man Days	Per Acre Basis Ribes	Per Acre Basis Gallons Spray
Kootenai	Open Reproduction	261	164	25,455		.63	98	
	Dense Reproduction	80	1	67		.01	1	
	Open Pole	779	607	40,490		.78	52	
	All Upland	1,120	772	66,012		.69	59	
	Stream (Hand)	533	805	62,875		1.51	118	
	All Types	1,653	1,577	128,887		.95	78	
Cabinet	Open Reproduction	469	930	210,832		1.98	450	
	Open Pole	361	273	27,506		.76	76	
	Dense Pole	153	61	2,794		.40	18	
	All Upland	983	1,264	241,132		1.29	245	
	Stream (Hand)	149	302	20,670		2.03	139	
	Stream (Chemical)	12	35	2,700	900	2.92	225	75
	All Stream	149	337	23,370		2.26	157	
	All Types	1,132	1,601	264,502		1.41	234	
Savenac Nursery	Open Reproduction	135	164	32,680		1.21	242	
	Stream (Hand)	619	877	287,010		1.42	464	
	Stream (Chemical)	62	103	12,400	4,130	1.66	200	67
	Stream (Machine)	15	36	3,000		2.40	200	
	All Stream	634	1,016	302,410		1.60	477	
	All Types	769	1,180	335,090		1.53	436	
All Forests	Open Reproduction	865	1,258	268,967		1.45	311	
	Dense Reproduction	80	1	67		.01	1	
	Open Pole	1,140	880	67,996		.77	60	
	Dense Pole	153	61	2,794		.40	18	
	All Upland	2,238	2,200	339,824		.98	152	
	Stream (Hand)	1,301	1,984	370,555		1.52	285	
	Stream (Chemical)	74	138	15,100	5,030	1.87	204	68
	Stream (Machine)	15	36	3,000		2.40	200	
	All Stream	1,316	2,158	388,655		1.64	295	
	All Types	3,554	4,358	728,479		1.23	205	

TABLE NO. 8C - THIRD WORKING

Forest	Eradication Type	Acres	Effective Man Days	Total Ribes	Per Acre Basis Man Days	Per Acre Basis Ribes
Cabinet	Open Reproduction	99	350	42,335	3.54	428
	Open Pole	38	95	5,806	2.50	153
	Dense Pole	12	4	60	.33	5
	All Upland	149	449	48,201	3.01	323
Savenac Nursery	Stream (Hand)	1,238	1,359	53,996	1.10	44
	Stream (Slash)	40	642	20,000	16.05	500
	All Stream	1,238	2,001	73,996	1.62	60
All Forests	Open Reproduction	99	350	42,335	3.54	428
	Open Pole	38	95	5,806	2.50	153
	Dense Pole	12	4	60	.33	5
	All Upland	149	449	48,201	3.01	323
	Stream (Hand)	1,238	1,369	53,996	1.10	44
	Stream (Slash)	40	642	20,000	16.05	500
	All Stream	1,238	2,001	73,996	1.62	60
	All Types	1,387	2,450	122,197	1.77	88

TABLE NO. 9

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1929-1938
MONTANA OPERATION

Working	Class	Acres	Effective Man Days	Total Ribes	Gallons Spray	Per Acre Basis: Man Days	Per Acre Basis: Ribes	Per Acre Basis: Gallons per Sprayed Area
First	EQ-Reg.	1,383	2,315	462,300	30,665	1.67	334	148
	FS-Reg.	3,573	2,935	623,129		.82	174	
	EQ-NIRA	21,773	8,027	2,158,067		.37	99	
	FS-NIRA	22,215	16,789	4,684,242	10,417	.76	211	40
	EQ-ERA	42,313	20,386	3,292,671	1,330	.48	78	44
	FS-ERA	4,708	8,393	1,455,235	9,205	1.78	309	111
	F-CCC	11,596	8,338	1,086,764	2,780	.72	94	59
	Total	107,561	67,183	13,762,408	54,397	.62	128	86
Second	EQ-Reg.	619	980	299,410	4,130	1.58	484	67
	FS-Reg.	304	261	39,405		.86	130	
	EQ-ERA	1,342	1,597	265,637		1.19	198	
	FS-ERA	1,190	1,441	120,392	900	1.21	101	75
	F-CCC	99	79	3,635		.80	37	
	Total	3,554	4,358	728,479	5,030	1.23	205	68
Third	FS-Reg.	739	1,673	63,157		2.26	85	
	EQ-ERA	648	777	59,040		1.20	91	
	Total	1,387	2,450	122,197		1.77	88	
All Workings	EQ-Reg.	2,002	3,295	761,710	34,795	1.65	380	129
	FS-Reg.	4,616	4,869	725,691		1.05	157	
	EQ-NIRA	21,773	8,027	2,158,067		.37	99	
	FS-NIRA	22,215	16,789	4,684,242	10,417	.76	211	40
	EQ-ERA	44,303	22,760	3,617,348	1,330	.51	82	44
	FS-ERA	5,898	9,834	1,575,627	10,105	1.67	267	106
	F-CCC	11,695	8,417	1,090,399	2,780	.72	93	59
	Total	112,502	73,991	14,613,084	59,427	.66	130	85

TABLE NO. 10

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1929-1938
MONTANA OPERATION

Working	Number of Acres Worked by Ownership Classes: Forest Service	State - Montana	Private	Total
First	88,736	696	18,129	107,561
Second	2,254		1,300	3,554
Third	335		1,052	1,387
All Workings	91,325	696	20,481	112,502

TABLE NO. 11

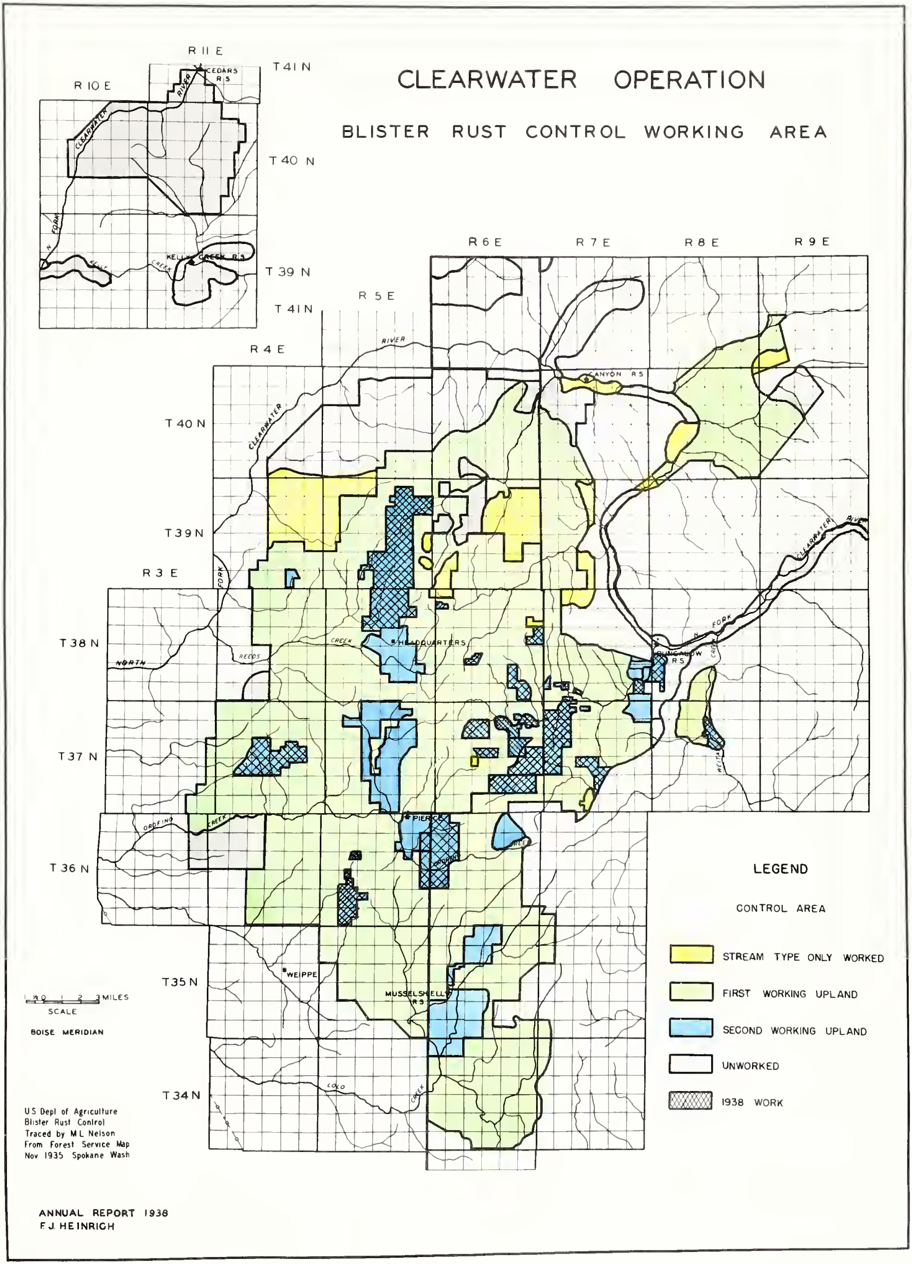
PROGRESS OF FIRST WORKING BY OWNERSHIP CLASSES, 1929-1938
MONTANA OPERATION

Ownership Classes	Number of Acres: Worked	Unworked	Total
Forest Service	88,736	74,789	163,525
State - Montana	696	234	930
Private	18,129	18,156	36,285
Total	107,561	93,179	200,740

TABLE NO. 12

TOTAL RIBES BY SPECIES ERADICATED, 1928-1938
MONTANA OPERATION

Working	Eradication Type	Acres	Ribes by Species							Total Ribes
			Ribes lacustre	Ribes viscosissimum	Ribes petiolare	Ribes inerme	Ribes irriguum	Ribes coloradense	Ribes triste	
First	Open Reproduction	33,674	2,055,293	2,646,062	4,626	55,569	113,754		1,145	4,876,449
	Dense Reproduction	4,464	142,815	60,781			1,048	2,215		206,859
	Open Pole	29,291	1,185,092	788,992		84,642	74,153			2,132,879
	Dense Pole	6,150	130,061	77,785		8,179	8,409			224,434
	Open Mature	14,504	1,124,244	170,733		11,080	8,729	7,069		1,321,855
	Dense Mature	8,885	52,148	4,807				172		57,127
	Brush	2,870	285,698	285,771		5,260	5,162			581,891
	Burn	115	32							32
	Meadow-Field	451	5,010			7,121				12,131
	All Upland	100,404	4,980,393	4,034,931	4,626	171,851	211,255	9,456	1,145	9,413,657
	Stream	7,157	2,655,708	109,156	246,922	1,278,479	5,744	31,619	21,123	4,348,751
	All Types	107,561	7,636,101	4,144,087	251,548	1,450,330	216,999	41,075	22,268	13,762,408
Second	Open Reproduction	865	53,920	199,906	267	4,650	10,224			268,967
	Dense Reproduction	80	63	4						67
	Open Pole	1,140	42,393	22,576		2,106	921			67,996
	Dense Pole	153	801	1,708		285				2,794
	All Upland	2,238	97,177	224,194	267	7,041	11,145			339,824
	Stream	1,316	50,753	800	19,757	312,979	4,366			388,655
	All Types	3,554	147,930	224,994	20,024	320,020	15,511			728,479
Third	Open Reproduction	99	25,133	17,002			200			42,335
	Open Pole	38	800	5,000			6			5,806
	Dense Pole	12		60						60
	All Upland	149	25,933	22,062			206			48,201
	Stream	1,238	2,318		11,154	60,524				73,996
	All Types	1,387	28,251	22,062	11,154	60,524	206			122,197
All Workings	Open Reproduction	34,638	2,134,346	2,862,970	4,893	60,219	124,178		1,145	5,187,751
	Dense Reproduction	4,544	142,878	60,785			1,048	2,215		206,926
	Open Pole	30,469	1,228,285	816,568		86,748	75,080			2,206,681
	Dense Pole	6,315	130,862	79,553		8,464	8,409			227,288
	Open Mature	14,504	1,124,244	170,733		11,080	8,729	7,069		1,321,855
	Dense Mature	8,885	52,148	4,807				172		57,127
	Brush	2,870	285,698	285,771		5,260	5,162			581,891
	Burn	115	32							32
	Meadow-Field	451	5,010			7,121				12,131
	All Upland	102,791	5,103,503	4,281,187	4,893	178,892	222,606	9,456	1,145	9,801,682
	Stream	9,711	2,708,779	109,956	277,833	1,651,982	10,110	31,619	21,123	4,811,402
	All Types	112,502	7,812,282	4,391,143	282,726	1,830,874	232,716	41,075	22,268	14,613,084



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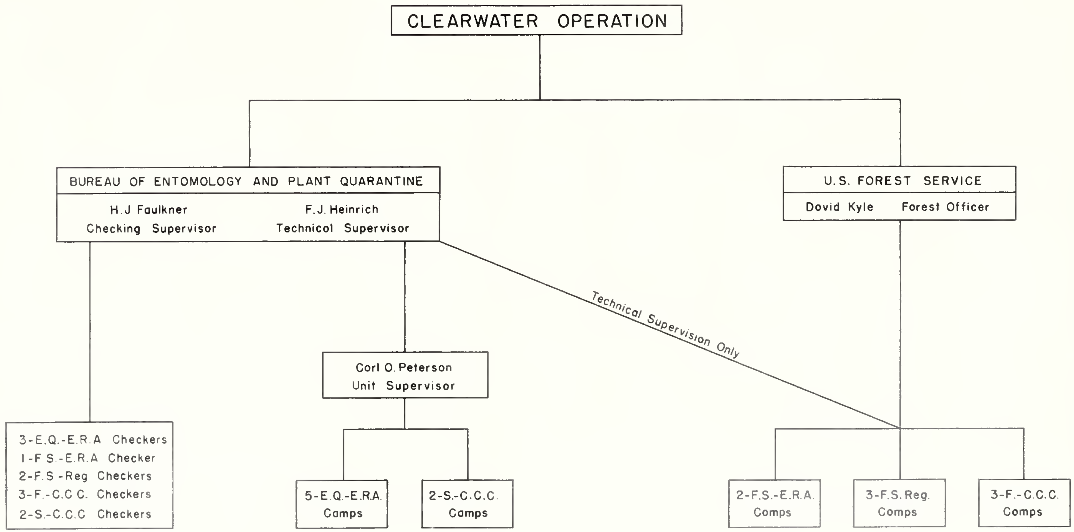
ORGANIZATION CHART



E.Q.-E.R.A.
* Number of Camps - 5
Number of Men - 390

S.-C.C.C.
Number of Camps - 2
Number of Men - 100

F.S.-E.R.A.
* Number of Camps - 2
Number of Men - 120

F.S.-Reg.
Number of Comps - 3
Number of Men - 90

F.-C.C.C.
Number of Comps - 3
Number of Men - 170

Totol Number of Men on Blister Rust Work - 870

* 1-60-Man Comp Transfered to E.Q.-E.R.A July 16

[illegible]

ORGANIZATION AND ADMINISTRATION

Blister rust control activities were handled in accordance [illegible] memorandum of understanding between the Bureau of Entomology and [illegible] and the U. S. Forest Service. The two organizations [illegible] facilities and worked cooperatively on all phases of the work. [illegible] central supply distributing base was maintained at [illegible] equipment and supplies for the outlying camps were [illegible] train. All Bureau supplies and equipment were hauled to the [illegible]

The Bureau camps were financed by funds allotted under the [illegible] Relief Act. The Forest Service camps were financed by funds allotted [illegible] Emergency Relief Act and regular funds allotted to the U. S. Forest [illegible] blister rust control work.

The men employed for the ERA camps, other than supervisory [illegible] were paid security wages and assigned by the Works Progress Administration. These men were all certified relief and [illegible] of previous years.

A field hospital was maintained again this year with a [illegible] nurse in charge. His duties consisted of first aid work and [illegible] of sanitary conditions in camps. The Nez Perce County Health [illegible] of the Idaho State Board of Health, gave fine cooperation again [illegible] matters pertaining to health and sanitation.

METHODS AND EQUIPMENT

[illegible] of the lack of regular funds and since the Works Progress Administration required that the [illegible] ratio be maintained, it was not [illegible] a training school. The men were given individual training [illegible] though it is realized that this is not too satisfactory.

Several two gallon pressure [illegible] tank [illegible] were used [illegible] in spraying R. petiolare. [illegible] in most cases superior to the standard [illegible]

Methods were similar to those used in previous years. The [illegible] crew on hand ribes eradication and the four-man crew on chemical [illegible] cation were set up as standard [illegible]. In some instances [illegible] used when it was not possible to get satisfactory [illegible] were believed more effective on [illegible] stream type work.

TABLE NO. [illegible]

EXPENDITURES BY APPROPRIATIONS, CALENDAR YEAR [illegible]
CLEARWATER OPERATION

Cooperating Agency	Appropriation	Amount
	Regular	$ 40,798.[illegible]
	ERA	24,7[illegible]
Forest Service	Total	65,5[illegible]
	Regular	8,453.80
Bureau of Entomology	ERA	[illegible]
and Plant Quarantine	Total	[illegible]
Total Expenditures	All Appropriations	$[illegible]

TABLE NO. [illegible]

CLASSIFIED EXPENDITURES, CALENDAR YEAR [illegible]
CLEARWATER OPERATION

Item	Forest Service			Bureau of Entomology and Plant Quarantine		
	Regular	ERA	Total	Regular	ERA	Total
Salaries [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Wages [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Subsistence [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Activity	Number Effective Man Days	Program Funds Cost	Total Cost	Effective Per [illegible]
[illegible]	15,540	[illegible]	$ 90,[illegible]	[illegible]
		[illegible] Rep.	6,487.93	
		[illegible] al	97,084.[illegible]	
[illegible]	3,[illegible]	[illegible] Rep.	2,464.[illegible]	[illegible]
		[illegible]	34,[illegible].21	
		[illegible]	186.[illegible]	
		[illegible] al	37,[illegible]	
[illegible] Rep	4,665	[illegible]	38,[illegible].18	
		[illegible]	[illegible].00	
		[illegible]	[illegible]	
[illegible]	10,863	[illegible] Rep.	[illegible]	[illegible]
		[illegible]	[illegible]	[illegible]
		[illegible] al	[illegible],392.[illegible]	[illegible]
Total Cost 1950 Program			$[illegible]	

	Forest Service	[illegible]
Number of meals served	90,[illegible]	[illegible]
Average cost per meal	[illegible]	[illegible]
Pounds of chemical	[illegible]	[illegible]
Pounds of [illegible]	[illegible]	[illegible]

TABLE NO. 3 - SUMMARY OF ALL WORKINGS

Eradication Type	Acres First Working	Acres Second Working	Acres Third Working	Total Acres	Effective Man Days	Total Ribes	Gallons Spray	Ribes Remaining Per Acre	
								Bushes	Live Stem
Open Reproduction	842	2,854		3,696	4,721	1,575,417		6.0	16.0
Dense Reproduction		82		82	43	2,084		.8	2.6
Open Pole		8,190		8,190	4,598	718,154		3.7	14.2
Dense Pole		1,569		1,569	616	107,911		3.4	10.8
Open Mature	474	5,125		5,599	4,091	504,048		2.6	8.6
Dense Mature		52		52	50	2,970			
Cut Over		9,261		9,261	6,165	2,802,384		3.4	9.7
Burn		240		240	178	43,803			
All Upland	1,316	27,373		28,689	20,462	5,756,771		3.5	11.6
Stream (Hand)	17	7,915	409	8,341	9,396	1,198,008			
Stream (Chemical)	6	1,758	325	2,089	4,094	180,873	60,291		
Stream (Zone)		1,666		1,666	1,129	280,094			
All Stream	17	9,581	409	10,007	14,619	1,658,975		2.9	7.0
All Types	1,333	36,954	409	38,696	35,081	7,415,746		3.3	10.1

TABLE NO. 3A - FIRST WORKING

Eradication Type	Acres	Effective Man Days	Total Ribes	Gallons Spray	Per Acre Basis			Ribes Remaining Per Acre	
					Man Days	Ribes	Gallons Spray	Bushes	Live Stem
Open Reproduction	842	1,931	1,316,470		2.30	1,564		10.3	24.8
Open Mature	474	522	141,948		1.10	299		3.7	16.3
All Upland	1,316	2,453	1,458,418		1.86	1,108		8.0	21.9
Stream (Hand)	17	114	33,229		6.70	1,955			
Stream (Chemical)	6	30	1,005	335	5.00	168	56		
All Stream	17	144	34,234		8.47	2,013		7.0	42.0
All Types	1,333	2,597	1,492,652		1.95	1,119		8.0	22.3

TABLE NO. 3B - SECOND WORKING

Eradication Type	Acres	Effective Man Days	Total Ribes	Gallons Spray	Man Days	Ribes	Gallons Spray	Bushes	Live Stem
Open Reproduction	2,854	2,790	258,947		.98	91		4.6	13.1
Dense Reproduction	82	43	2,084		.52	25		.8	2.6
Open Pole	8,190	4,598	718,154		.56	88		3.7	14.2
Dense Pole	1,569	616	107,911		.39	69		3.4	10.8
Open Mature	5,125	3,569	362,100		.70	71		2.6	8.1
Dense Mature	52	50	2,970		.96	57			
Cut Over	9,261	6,165	2,802,384		.67	303		3.4	9.7
Burn	240	178	43,803		.74	182			
All Upland	27,373	18,009	4,298,353		.66	157		3.4	11.2
Stream (Hand)	7,915	8,892	1,105,354		1.12	139			
Stream (Chemical)	1,758	3,955	177,291	59,097	2.25	101	34		
Stream (Zone)	1,666	1,129	280,094		.68	168			
All Stream	9,581	13,976	1,562,739		1.46	163		2.8	6.9
All Types	36,954	31,985	5,861,092		.87	159		3.2	9.8

TABLE NO. 3C - THIRD WORKING

Eradication Type	Acres	Effective Man Days	Total Ribes	Gallons Spray	Man Days	Ribes	Gallons Spray	Bushes	Live Stem
Stream (Hand)	409	390	59,425		.95	145			
Stream (Chemical)	325	109	2,577	859	.33	8	3		
All Stream	409	499	62,002		1.22	152		3.6	8.7

TABLE NO. 4

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1938
CLEARWATER OPERATION

Working	Class	Acres	Effective Man Days	Total Ribes	Gallons Spray	Per Acre Basis: Man Days	Per Acre Basis: Ribes	Per Acre Basis: Gallons Per Sprayed Area	Ribes Remaining Per Acre: Bushes	Ribes Remaining Per Acre: Live Stem
First	EQ-ERA	332	559	155,420		1.68	468			
	FS-Reg.	995	1,926	1,310,477		1.94	1,317			
	F-CCC	6	112	26,755	335	18.70	4,459	55.8		
	Total	1,333	2,597	1,492,652	335	1.95	1,120	55.8		
Second	EQ-ERA	17,851	15,090	3,220,080	37,754	.84	180	33.4		
	FS-ERA	5,858	3,733	452,221	2,044	.64	77	27.2		
	FS-Reg.	4,751	2,719	416,559	6,841	.57	88	26.3		
	F-CCC	5,183	6,144	670,206	5,122	1.18	129	60.2		
	S-CCC	3,311	4,299	1,102,026	7,336	1.29	333	9.64		
	Total	36,954	31,985	5,861,092	59,097	.87	159	33.6		
Third	FS-ERA	176	186	36,187	348	1.06	206	3.0		
	F-CCC	233	313	25,815	511	1.34	111	2.4		
	Total	409	499	62,002	859	1.22	152	2.64		
All Workings	EQ-ERA	18,183	15,649	3,375,500	37,754	.86	185	33.4	2.5	6.4
	FS-ERA	6,034	3,919	488,408	2,392	.64	81	12.5	3.1	8.6
	FS-Reg.	5,746	4,645	1,727,036	6,841	.81	301	26.3	5.9	21.2
	F-CCC	5,422	6,569	722,776	5,968	1.21	133	19.89	4.3	14.1
	S-CCC	3,311	4,299	1,102,026	7,336	1.29	333	9.64	1.9	5.8
	Total	38,696	35,081	7,415,746	60,291	.91	192	28.8	3.3	10.1

TABLE NO. 5

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1938
CLEARWATER OPERATION

State	Working	By Forest Service: Federal: Forest Service	By Forest Service: Federal: Public Domain	By Forest Service: Federal: Total	By Forest Service: State	By Forest Service: Private	By Bureau of Entomology and Plant Quarantine: Forest Service	By Bureau of Entomology and Plant Quarantine: State	By Bureau of Entomology and Plant Quarantine: Private	Total: Federal: Forest Service	Total: Federal: Public Domain	Total: Federal: Total	Total: State	Total: Private	Total
Idaho	First	841		841		160		172	160	841		841	172	320	1,333
	Second	11,788	468	12,256	1,038	2,498	2,313	5,344	13,505	14,101	468	14,569	6,382	16,003	36,954
	Third	209	12	221	52	136				209	12	221	52	136	409
	Total	12,838	480	13,318	1,090	2,794	2,313	5,516	13,665	15,151	480	15,631	6,606	16,459	38,696

TABLE NO. 6

RESULTS OF CHECKING ON AREAS WORKED, 1938
CLEARWATER OPERATION

Eradication Type	Average Results for All Areas: Acres in Checked Area	Acres Checked	Ribes Per Acre: Bushes	Ribes Per Acre: Live Stem	Areas With More Than 25 Feet Live Stem Per Acre: Acres	Ribes Per Acre: Bushes	Ribes Per Acre: Live Stem
Open Reproduction	2,610	104	6.0	16.0	501	18.9	41.0
Dense Reproduction	132	5	.8	2.6			
Open Pole	8,833	359	3.7	14.2	1,363	13.6	54.1
Dense Pole	436	17	3.4	10.8	45	13.0	31.0
Open Mature	5,459	218	2.6	8.6	300	14.3	41.7
Cut Over	7,766	308	3.4	9.7	590	15.8	36.5
Meadow-Field	87	4					
All Upland	25,323	1,015	3.5	11.6	2,799	15.1	46.3
Stream	4,194	486	2.9	7.0	6	5.0	40.0
All Types	29,517	1,501	3.3	10.1	2,805	15.0	46.3

TABLE NO. 7

TOTAL RIBES BY SPECIES ERADICATED, 1938
CLEARWATER OPERATION

Working	Eradication Type	Acres	Ribes by Species						Total Ribes
			Ribes lacustre	Ribes viscosissimum	Ribes petiolare	Ribes inerme	Ribes irriguum	Ribes triste	
First	Open Reproduction	842	287,482	1,028,988					1,316,470
	Open Mature	474	122,088	19,860					141,948
	All Upland	1,316	409,570	1,048,848					1,458,418
	Stream	17	21,091	289	1,005	11,849			34,234
	All Types	1,333	430,661	1,049,137	1,005	11,849			1,492,652
Second	Open Reproduction	2,854	97,668	160,423	852	4			258,947
	Dense Reproduction	82	34	2,050					2,084
	Open Pole	8,190	296,945	412,967	7,991	1	250		718,154
	Dense Pole	1,569	101,801	2,734	3,376				107,911
	Open Mature	5,125	209,675	149,733	2,425			267	362,100
	Dense Mature	52	2,814	156					2,970
	Cut Over	9,261	351,006	2,433,288	12,636		5,454		2,802,384
	Burn	240	16,348	22,008	5,447				43,803
	All Upland	27,373	1,076,291	3,183,359	32,727	5	5,704	267	4,298,353
	Stream	9,581	900,513	396,356	242,894	7,159	9,141	6,676	1,562,739
	All Types	36,954	1,976,804	3,579,715	275,621	7,164	14,845	6,943	5,861,092
Third	Stream	409	40,259	887	4,818	16,038			62,002
All Workings	Open Reproduction	3,696	385,150	1,189,411	852	4			1,575,417
	Dense Reproduction	82	34	2,050					2,084
	Open Pole	8,190	296,945	412,967	7,991	1	250		718,154
	Dense Pole	1,569	101,801	2,734	3,376				107,911
	Open Mature	5,599	331,763	169,593	2,425			267	504,048
	Dense Mature	52	2,814	156					2,970
	Cut Over	9,261	351,006	2,433,288	12,636		5,454		2,802,384
	Burn	240	16,348	22,008	5,447				43,803
	All Upland	28,689	1,485,861	4,232,207	32,727	5	5,704	267	5,756,771
	Stream	10,007	961,863	397,532	248,717	35,046	9,141	6,676	1,658,975
	All Types	38,696	2,447,724	4,629,739	281,444	35,051	14,845	6,943	7,415,746

SUMMARY OF RIBES ERADICATION, 1929-1938
CLEARWATER OPERATION

TABLE NO. 8 - SUMMARY OF ALL WORKINGS

Eradication Type	Acres First Working	Acres Second Working	Acres Third Working	Total Acres	Effective Man Days	Total Ribes	Gallons Spray
Open Reproduction	56,191	7,526		63,717	98,044	31,492,693	
Dense Reproduction	11,088	493		11,581	5,286	1,164,891	
Open Pole	25,441	10,505		35,946	20,504	4,383,146	
Dense Pole	3,534	1,569		5,103	1,553	292,973	
Open Mature	213,922	15,216		229,138	106,537	24,022,005	
Dense Mature	5,309	324		5,633	559	134,244	
Cut Over	27,726	16,655		44,381	37,669	14,607,776	
Brush	2,795	79		2,874	2,578	732,633	
Burn	1,045	240		1,285	1,424	961,412	
Subalpine	122			122	118	53,948	
Meadow-Field	1,890			1,890			
All Upland	349,063	52,607		401,670	274,272	77,845,721	
Stream (Hand)	40,937	21,289	2,174	64,400	61,770	13,882,568	
Stream (Chemical)	14,186	5,447	388	20,021	37,275	2,617,734	872,378
Stream (Slash)	65	13		78	1,258	188,983	
Stream (Zone)		1,666		1,666	1,129	280,094	
All Stream	41,442	23,247	2,174	66,863	101,432	16,969,379	
All Types	390,505	75,854	2,174	468,533	375,704	94,815,100	

TABLE NO. 8A - FIRST WORKING

Eradication Type	Acres	Effective Man Days	Total Ribes	Gallons Spray	Per Acre Basis: Man Days	Per Acre Basis: Ribes	Per Acre Basis: Gallons Spray
Open Reproduction	56,191	92,315	30,875,057		1.64	549	
Dense Reproduction	11,088	5,214	1,161,593		.47	105	
Open Pole	25,441	15,201	3,600,567		.60	142	
Dense Pole	3,534	937	165,062		.27	52	
Open Mature	213,922	99,313	23,278,579		.46	108	
Dense Mature	5,309	493	130,871		.09	25	
Cut Over	27,726	25,888	10,610,089		.93	383	
Brush	2,795	2,536	729,247		.91	261	
Burn	1,045	1,246	917,609		1.19	878	
Subalpine	122	118	53,948		.97	442	
Meadow-Field	1,890						
All Upland	349,063	243,261	71,542,622		.69	205	
Stream (Hand)	40,937	43,266	11,029,427		1.05	269	
Stream (Chemical)	14,186	29,542	2,278,616	759,272	2.08	160	53.5
Stream (Slash)	65	1,233	188,983		18.97	2,907	
All Stream	41,442	74,041	13,497,026		1.79	326	
All Types	390,505	317,302	85,039,648		.81	218	

TABLE NO. 8B - SECOND WORKING

Eradication Type	Acres	Effective Man Days	Total Ribes	Gallons Spray	Per Acre Basis: Man Days	Per Acre Basis: Ribes	Per Acre Basis: Gallons Spray
Open Reproduction	7,526	5,729	617,636		.76	82	
Dense Reproduction	493	72	3,298		.15	6	
Open Pole	10,505	5,303	782,579		.50	74	
Dense Pole	1,569	616	107,911		.39	69	
Open Mature	15,216	7,224	743,426		.47	49	
Dense Mature	324	66	3,373		.20	10	
Cut Over	16,655	11,781	3,997,687		.71	240	
Brush	79	42	3,386		.53	43	
Burn	240	178	43,803		.74	183	
All Upland	52,607	31,011	6,303,099		.59	120	
Stream (Hand)	21,289	16,900	2,617,778		.80	123	
Stream (Chemical)	5,447	7,510	330,775	110,325	1.38	61	20.2
Stream (Slash)	13	25			1.92		
Stream (Zone)	1,666	1,129	280,094		.67	168	
All Stream	23,247	25,564	3,228,647		1.10	139	
All Types	75,854	56,575	9,531,746		.75	126	

TABLE NO. 8C - THIRD WORKING

Eradication Type	Acres	Effective Man Days	Total Ribes	Gallons Spray	Per Acre Basis: Man Days	Per Acre Basis: Ribes	Per Acre Basis: Gallons Spray
Stream (Hand)	2,174	1,604	235,363		.74	108	
Stream (Chemical)	388	223	8,343	2,781	.57	22	7.2
All Stream	2,174	1,827	243,706		.84	112	

TABLE NO. 9

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1929-1938
CLEARWATER OPERATION

Working	Class	Acres	Effective Man Days	Total Ribes	Gallons Spray	Per Acre Basis: Man Days	Per Acre Basis: Ribes	Per Acre Basis: Gallons Per Sprayed Area
First	FS-Reg.	10,418	13,268	5,519,870	15,057	1.27	530	76
	EQ-NIRA	19,009	12,345	5,679,694	13,361	.65	299	69
	FS-NIRA	41,460	33,021	12,605,276	11,694	.80	304	79
	EQ-ERA	62,640	60,861	14,881,129	75,622	.97	238	77
	FS-ERA	2,150	3,198	1,350,528		1.48	628	
	Cooperative	91,453	59,665	18,267,124	283,158	.65	200	36
	F-CCC	65,029	58,470	12,649,381	148,629	.90	195	
	S&P-CCC	98,346	76,474	14,086,646	211,751	.78	143	87
	Total	390,505	317,302	85,039,648	759,272	.81	218	
Second	FS-Reg.	11,360	4,108	581,787	6,841	.36	51	
	EQ-NIRA	1,076	660	159,890	3,355	.61	149	45
	FS-NIRA	2,498	2,342	175,212	8,007	.93	70	21
	EQ-ERA	32,156	24,840	4,904,239	40,991	.77	153	
	FS-ERA	8,246	5,165	513,690	2,044	.62	62	
	Cooperative	4,843	2,898	553,110	10,553	.60	114	3
	F-CCC	8,178	8,916	1,134,129	16,400	1.09	139	
	S&P-CCC	7,497	7,646	1,509,689	22,134	1.02	201	
	Total	75,854	56,575	9,531,746	110,325	.75	126	
Third	FS-Reg.	446	348	31,543		.78	71	
	FS-NIRA	914	747	127,700	1,922	.82	140	30
	FS-ERA	284	319	44,201	346	1.12	156	
	F-CCC	233	313	25,815	511	1.34	111	
	S&P-CCC	297	100	14,447		.34	49	
	Total	2,174	1,827	243,706	2,781	.84	112	
All Workings	FS-Reg.	22,224	17,724	6,133,200	21,898	.80	276	
	EQ-NIRA	20,085	13,005	5,839,584	16,716	.65	291	64
	FS-NIRA	44,872	36,110	12,908,188	21,623	.80	288	36
	EQ-ERA	94,796	85,701	19,785,368	116,613	.90	209	
	FS-ERA	10,680	8,682	1,908,419	2,392	.81	179	
	Cooperative	96,296	62,563	18,820,234	293,711	.65	195	27
	F-CCC	73,440	67,699	13,809,325	165,540	.92	188	
	S&P-CCC	106,140	84,220	15,610,782	233,885	.79	147	
	Total	468,533	375,704	94,815,100	872,378	.80	202	

TABLE NO. 10

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1929-1938
CLEARWATER OPERATION

Working	Number of Acres Worked by Ownership Classes: Federal: Forest Service	Federal: Public Domain	Federal: Total	State - Idaho	Private	Total
First	145,431	3,680	149,111	78,834	162,560	390,505
Second	35,804	628	36,432	9,547	29,875	75,854
Third	1,748	12	1,760	152	262	2,174
All Workings	182,983	4,320	187,303	88,533	192,697	468,533

TABLE NO. 11

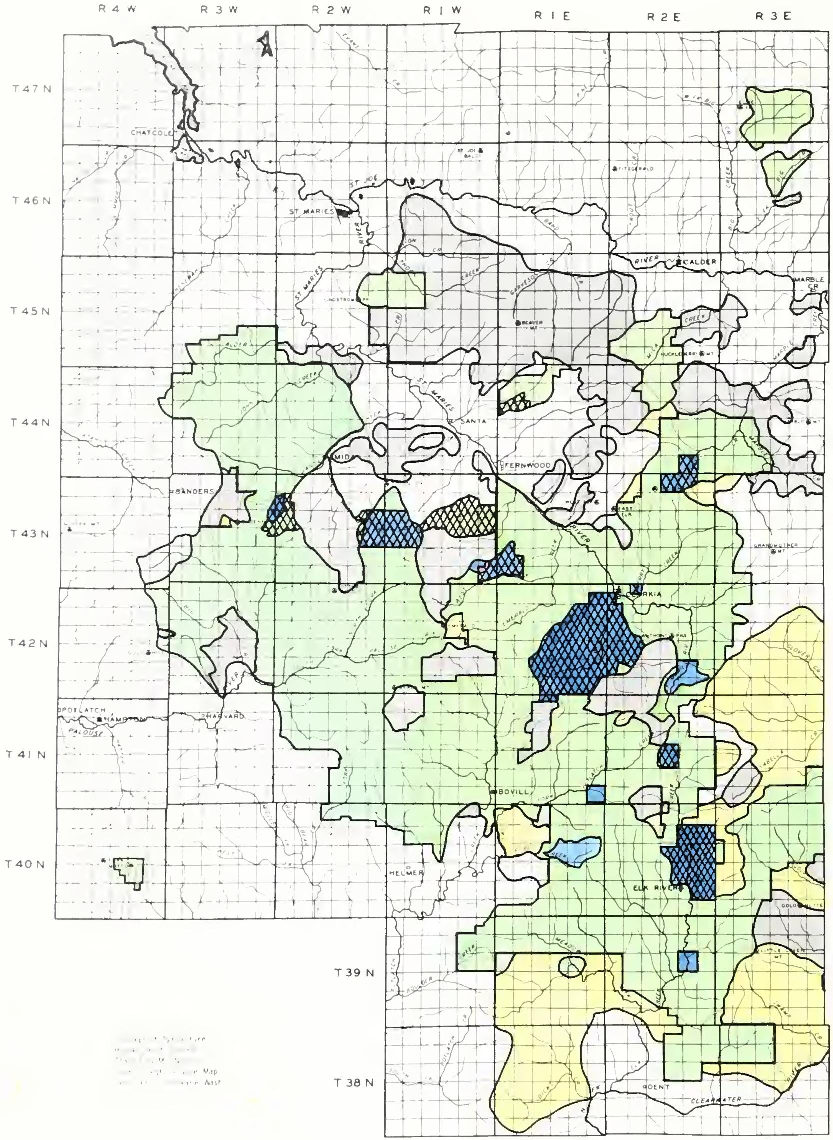
PROGRESS OF FIRST WORKING BY OWNERSHIP CLASSES, 1929-1938
CLEARWATER OPERATION

Ownership Class	Number of Acres: Worked	Unworked	Total
Forest Service	145,431	59,299	204,730
Public Domain	3,680	350	4,030
Sub-total Federal	149,111	59,649	206,760
State	78,834	14,156	92,990
Private	162,560	45,690	208,250
Total	390,505	119,495	510,000

TABLE NO. 12

TOTAL RIBES BY SPECIES ERADICATED, 1929-1938
CLEARWATER OPERATION

Working	Eradication Type	Acres	Ribes by Species						Total Ribes
			Ribes lacustre	Ribes viscosissimum	Ribes petiolare	Ribes inerme	Ribes irriguum	Ribes triste	
First	Open Reproduction	56,191	7,358,596	23,286,567	72,747	41,600	115,547		30,875,057
	Dense Reproduction	11,088	157,346	980,480	2,457	5,726	15,584		1,161,593
	Open Pole	25,441	2,340,591	1,221,117	31,301	6	7,090	462	3,600,567
	Dense Pole	3,534	127,043	57,703	316				185,062
	Open Mature	213,922	16,150,989	6,765,749	197,117	107,057	57,641	26	23,278,579
	Dense Mature	5,309	104,873	22,438	715	865	1,980		130,871
	Cut Over	27,726	2,100,601	8,431,923	38,603	27,752	11,210		10,610,089
	Brush	2,795	210,516	490,931	17,270	114	10,416		729,247
	Burn	1,045	74,796	838,377	568		3,868		917,609
	Subalpine	122	53,500	448					53,948
	Meadow-Field	1,890							
	All Upland	349,063	28,678,851	42,095,733	361,094	183,120	223,336	488	71,542,622
	Stream	41,442	9,784,636	324,255	2,660,907	701,834	25,394		13,497,026
	All Types	390,505	38,463,487	42,419,988	3,022,001	884,954	248,730	488	85,039,648
Second	Open Reproduction	7,526	183,573	427,736	6,323	4			617,636
	Dense Reproduction	493	102	3,192	4				3,298
	Open Pole	10,505	315,644	455,002	11,682	1	250		782,579
	Dense Pole	1,569	101,801	2,734	3,376				107,911
	Open Mature	15,216	369,874	357,401	15,768	116		267	743,426
	Dense Mature	324	3,058	315					3,373
	Cut Over	16,655	535,931	3,425,410	30,892		5,454		3,997,687
	Brush	79	424	2,962					3,386
	Burn	240	16,348	22,008	5,447				43,803
	All Upland	52,607	1,526,755	4,696,760	73,492	121	5,704	267	6,303,099
	Stream	23,247	1,839,513	508,851	787,750	76,716	9,141	6,676	3,228,647
	All Types	75,854	3,366,268	5,205,611	861,242	76,837	14,845	6,943	9,531,746
Third	Stream	2,174	178,214	2,038	40,638	22,816			243,706
All Workings	Open Reproduction	63,717	7,542,169	23,714,303	79,070	41,604	115,547		31,492,693
	Dense Reproduction	11,581	157,448	983,672	2,461	5,726	15,584		1,164,891
	Open Pole	35,946	2,656,235	1,676,119	42,983	7	7,340	462	4,383,146
	Dense Pole	5,103	228,844	60,437	3,692				292,973
	Open Mature	229,138	16,520,863	7,123,150	212,885	107,173	57,641	293	24,022,005
	Dense Mature	5,633	107,931	22,753	715	865	1,980		134,244
	Cut Over	44,381	2,636,532	11,857,333	69,495	27,752	16,664		14,607,776
	Brush	2,874	210,940	493,893	17,270	114	10,416		732,633
	Burn	1,285	91,144	860,385	6,015		3,868		961,412
	Subalpine	122	53,500	448					53,948
	Meadow-Field	1,890							
	All Upland	401,670	30,205,606	46,792,493	434,586	183,241	229,040	755	77,845,721
	Stream	66,863	11,802,363	835,144	3,489,295	801,366	34,535	6,676	16,969,379
	All Types	468,533	42,007,969	47,627,637	3,923,881	984,607	263,575	7,431	94,815,100



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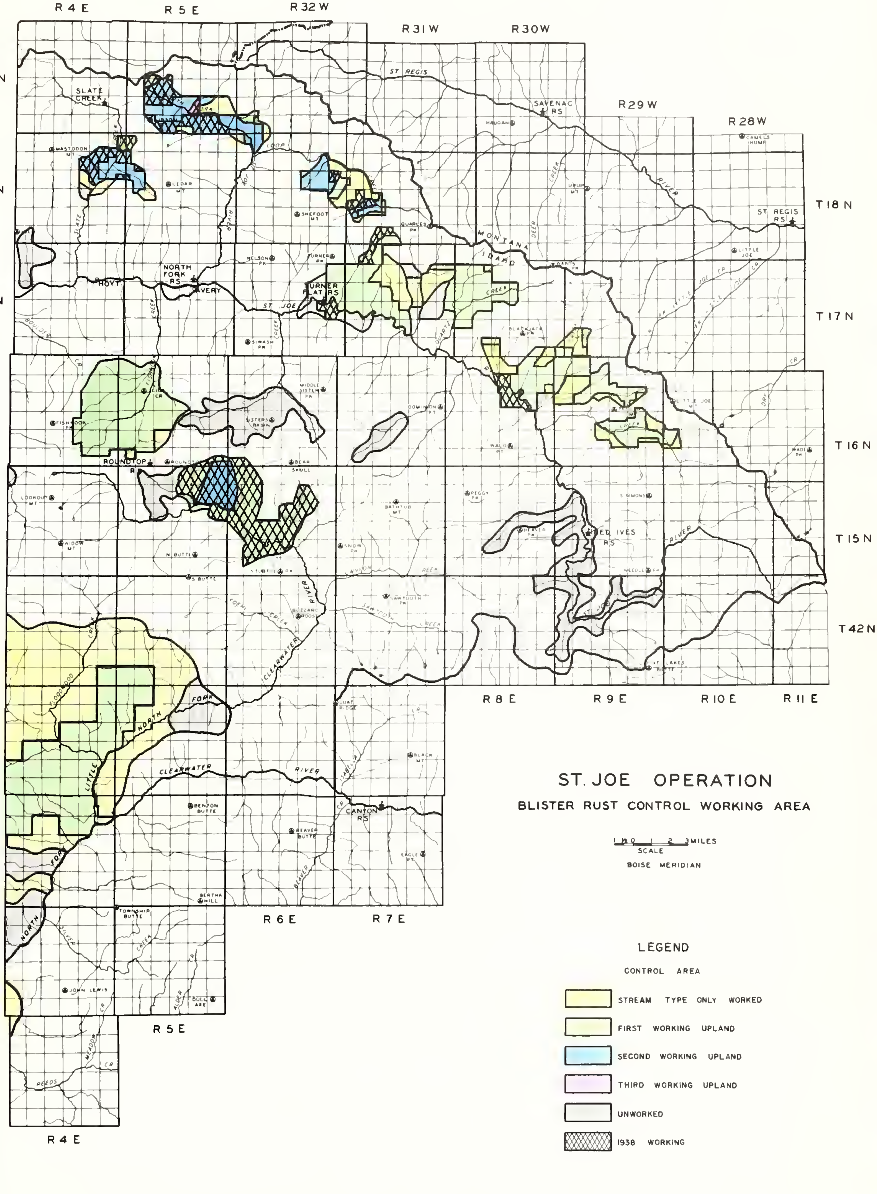
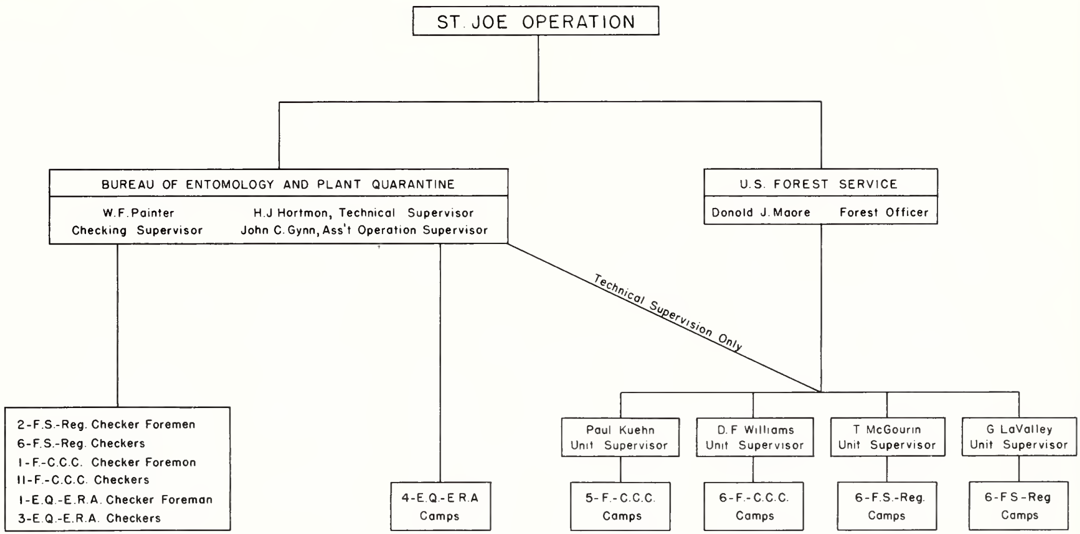

ST. JOE OPERATION
BLISTER RUST CONTROL WORKING AREA
SCALE
BOISE MERIDIAN
LEGEND
CONTROL AREA
STREAM TYPE ONLY WORKED
FIRST WORKING UPLAND
SECOND WORKING UPLAND
THIRD WORKING UPLAND
UNWORKED
1938 WORKING
R 4 E
R 5 E
R 32 W
R 31 W
R 30 W
R 29 W
R 28 W
R 6 E
R 7 E
R 8 E
R 9 E
R 10 E
R 11 E
T 47 N
T 46 N
T 45 N
T 44 N
T 43 N
T 42 N
T 41 N
T 40 N
T 39 N
T 38 N
T 18 N
T 17 N
T 16 N
T 15 N
T 42 N
MONTANA
IDAHO
ST. REGIS
SAVENAC RS
ST. REGIS RS
NORTH FORK RS
AVERY
HOYT
TURNER FLAT RS
ROUNDTOP RS
RED IVES RS
CANYON RS
CLEARWATER RIVER
LITTLE NORTH FORK

W 2309-1. Excellent stand of western white pine reproduction heavily infected by white pine blister rust. The presence of the rust is evident from the numerous dead branches or "flags" which have a white appearance in this photograph. Nearly every pine appearing in the picture is infected. The rust started in this area in 1927. Ribes eradication was performed on the stream type in 1935 and on the upland in 1936. The stand is shown here as it appeared in 1937.

W 2309-2. Pine infection of above area as it appeared in 1938. Ribes eradication stopped further infection and flagging decreased. The continued action of the infection already established is evident from the broken tops of some of the pine. The last years flags have lost their needles and from the resulting appearance the observer is given a false sense of security in regard to the fate of such a stand so heavily infected previous to ribes eradication.

ORGANIZATION CHART



E.Q.-E.R.A.
Number of Comps - 4
Number of Men - 400

F.- C.C.C.
Number of Comps - 11
Number of Men - 660

F.S - Reg.
Number of Camps - 12
Number af Men - 390

Number of Men on Blister Rust Work — 1450

[illegible] cooperation [illegible] the Army [illegible] of the Forest Service was made by the Army [illegible] administered by the Army, although the Forest Service [illegible]

Orders for camp equipment, if supervisory personnel [illegible] requisitions for supplies for the Insect [illegible] through the Forest Supervisor's Office [illegible] at [illegible] from which supplies were distributed [illegible] until abolition of the CCC [illegible] These supplies were ordered by the camp superintendent [illegible] spike camps.

Injured employees except CCC enrollees were [illegible] by the U. S. Compensation Commission doctor. [illegible] a fully equipped ambulance for this purpose. [illegible] were followed in all cases.

LOCATION OF CONTROL [illegible] CAMPS

[illegible]

Six regular camps were established [illegible] North Fork of the Clearwater River and were engaged [illegible] eradication on areas supporting well stocked stands of [illegible] 10 to 60 and 61 to 100. Streams within this [illegible] heavy concentrations of *Ribes petiolare* [illegible] chemical were used.

The CCC camps in the [illegible] North Fork [illegible] of high quality white pine [illegible] Creek and [illegible] areas in the [illegible] Idaho. The CCC camps [illegible] Creek, [illegible] Creek, and the North Fork of [illegible] the greater portion of the work being [illegible]

Three of the four [illegible] camps [illegible] eradication on areas which were given initial [illegible] Only roads and [illegible] were [illegible]

W 2573. Excellent stand of advanced western white pine reproduction in the Bond Creek drainage. From 30 to 35 percent of the trees in this privately owned stand are infected. Under the small control program it has not been possible to protect this area.

W 2567. Ramskull Creek drainage near Emida, Idaho. This area was logged in 1928 and 1929. Slash was piled and broadcast burned in 1930. Snag felling and a second broadcast burn were completed by the CCC in the fall of 1936 and followed by planting in 1937 and 1938. Ribes eradication was performed on this area in 1938.

TABLE [illegible]

[illegible]

Cooperating Agency	[illegible]
Federal Govt. [illegible]	[illegible]
Bureau of [illegible] and [illegible]	[illegible]
Total Expenditures	All Appropriations [illegible]

TABLE [illegible]

[illegible]

[illegible]	Total [illegible]	[illegible]
Salaries [illegible]	[illegible]	[illegible]
Salaries [illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible] Supplies	[illegible]	[illegible]
Equipment	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
Other [illegible]	[illegible]	[illegible]
Total	[illegible]	[illegible]

SUMMARY OF RIBES ERADICATION, 1938
ST. JOE OPERATION

TABLE NO. 3 - SUMMARY OF ALL WORKINGS

Eradication Type	Acres First Working	Acres Second Working	Acres Third Working	Total Acres	Effective Man Days	Total Ribes	Gallons Spray	Ribes Remaining Per Acre	
								Bushes	Live Stem
Open Reproduction	5,439	18,677	263	24,379	32,934	7,054,023		5	10
Dense Reproduction	1,249	1,350		2,599	1,043	220,565		2	6
Open Pole	8,094	4,806		12,900	6,812	1,782,139		3	7
Dense Pole	294	822		1,116	331	49,396		1	4
Open Mature	4,044	2,033		6,077	5,626	1,277,934		4	7
Dense Mature		188		188	49	11,822		1	2
Cut Over		64		64	2	18			
All Upland	19,120	27,940	263	47,323	46,797	10,395,897		4	8
Stream (Hand)	579	1,849	2,573	5,001	9,925	2,787,652		5	8
Stream (Chemical)	366	393	255	1,014	2,182	231,300	77,100		
All Stream	579	1,849	2,573	5,001	12,107	3,018,952		5	8
All Types	19,699	29,789	2,836	52,324	58,904	13,414,849		4	8

TABLE NO. 3A - FIRST WORKING

Eradication Type	Acres	Effective Man Days	Total Ribes	Gallons Spray	Per Acre Basis			Ribes Remaining Per Acre	
					Man Days	Ribes	Gallons Spray	Bushes	Live Stem
Open Reproduction	5,439	13,396	3,677,873		2.46	676		8	17
Dense Reproduction	1,249	437	116,814		.35	94		1	3
Open Pole	8,094	5,065	1,522,598		.63	188		3	8
Dense Pole	294	32	4,622		.11	16		2	7
Open Mature	4,044	4,617	940,237		1.14	233		4	8
All Upland	19,120	23,547	6,262,144		1.23	328		4	10
Stream (Hand)	579	2,273	961,403		3.93	1,660		4	9
Stream (Chemical)	366	1,519	165,102	55,034	4.15	451	150		
All Stream	579	3,792	1,126,505		6.55	1,946		4	9
All Types	19,699	27,339	7,388,649		1.39	375		4	10

TABLE NO. 3B - SECOND WORKING

Eradication Type	Acres	Effective Man Days	Total Ribes	Gallons Spray	Man Days	Ribes	Gallons Spray	Bushes	Live Stem
Open Reproduction	18,677	19,395	3,368,331		1.04	180		4	8
Dense Reproduction	1,350	606	103,751		.45	77		2	9
Open Pole	4,806	1,747	259,541		.36	54		2	6
Dense Pole	822	299	44,774		.36	54		1	2
Open Mature	2,033	1,009	337,697		.50	166		5	3
Dense Mature	188	49	11,822		.26	63		1	2
Cut Over	64	2	18		.03	1			
All Upland	27,940	23,107	4,125,934		.83	148		4	7
Stream (Hand)	1,849	3,757	963,048		2.03	521		6	7
Stream (Chemical)	393	496	50,028	16,676	1.26	127	42		
All Stream	1,849	4,253	1,013,076		2.30	548		6	7
All Types	29,789	27,360	5,139,010		.92	173		4	7

TABLE NO. 3C - THIRD WORKING

Eradication Type	Acres	Effective Man Days	Total Ribes	Gallons Spray	Man Days	Ribes	Gallons Spray	Bushes	Live Stem
Open Reproduction	263	143	7,819		.54	30		3	5
All Upland	263	143	7,819		.54	30		3	5
Stream (Hand)	2,573	3,895	863,201		1.51	335		4	10
Stream (Chemical)	255	167	16,170	5,390	.65	63	21		
All Stream	2,573	4,062	879,371		1.58	342		4	10
All Types	2,836	4,205	887,190		1.48	313		4	10

TABLE NO. 4

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1938
ST. JOE OPERATION

Working	Class	Acres	Effective Man Days	Total Ribes	Gallons Spray	Per Acre Basis			Ribes Remaining Per Acre	
						Man Days	Ribes	Gallons Per Sprayed Area	Bushes	Live Stem
First	EQ-ERA	3,471	5,107	1,962,904		1.47	566		4	8
	FS-Reg.	12,186	10,361	2,704,755	54,144	.85	222	150	3	8
	F-CCC	4,042	11,871	2,720,990	890	2.93	673	178	10	21
	Total	19,699	27,339	7,388,649	55,034	1.39	375	150	4	10
Second	EQ-ERA	15,770	12,164	2,985,757	7,280	.77	189	49	3	5
	FS-Reg.	7,687	6,085	957,257	8,226	.79	125	34	6	8
	F-CCC	6,332	9,111	1,195,996	1,170	1.44	189	390	6	11
	Total	29,789	27,360	5,139,010	16,676	.92	173	42	4	7
Third	EQ-ERA	847	1,037	307,819	3,025	1.22	363	12	4	11
	FS-Reg.	1,377	2,065	424,170	2,365	1.50	308	237	2	4
	F-CCC	612	1,103	155,201		1.80	254		11	24
	Total	2,836	4,205	887,190	5,390	1.48	313	21	4	9
All Workings	EQ-ERA	20,088	18,308	5,256,480	10,305	.91	262	26	3	6
	FS-Reg.	21,250	18,511	4,086,182	64,735	.87	192	106	4	7
	F-CCC	10,986	22,085	4,072,187	2,060	2.01	371	258	8	15
	Total	52,324	58,904	13,414,849	77,100	1.13	256	76	4	8

TABLE NO. 5

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1938
ST. JOE OPERATION

		Number of Acres Worked															
		By Forest Service					By Bureau of Entomology and Plant Quarantine					Total					
		Federal					Federal					Federal					
State	Working	Forest Service	Public Domain	Total	State	Private	Forest Service	Public Domain	Total	State	Private	Forest Service	Public Domain	Total	State	Private	Total
Idaho	First	10,997	80	11,077	80	5,071	1,052		1,052	610	1,809	12,049	80	12,129	690	6,880	19,699
	Second	10,227		10,227	681	3,111	7,514	1,281	8,795	2,210	4,765	17,741	1,281	19,022	2,891	7,876	29,789
	Third	782		782	97	1,110	644	32	676		171	1,426	32	1,458	97	1,281	2,836
	Total	22,006	80	22,086	858	9,292	9,210	1,313	10,523	2,820	6,745	31,216	1,393	32,609	3,678	16,037	52,324

TABLE NO. 6

RESULTS OF CHECKING ON AREAS WORKED, 1938
ST. JOE OPERATION

	Average Results for All Areas				Areas With More Than 25 Feet Live Stem Per Acre		
	Acres in	Acres	Ribes Per Acre			Per Acre	
Eradication Type	Checked Area	Checked	Bushes	Live Stem	Acres	Bushes	Live Stem
Open Reproduction	24,443	879	5	10	2,389	20	51
Dense Reproduction	2,599	89	2	6			
Open Pole	12,900	545	3	7	599	20	46
Dense Pole	1,116	33	1	4			
Open Mature	6,077	216	4	7	145	11	38
Dense Mature	188	8	1	2			
All Upland	47,323	1,770	4	8	3,133	20	49
Stream	5,001	870	5	8	210	21	52
All Types	52,324	2,640	4	8	3,343	20	50

TABLE NO. 7

TOTAL RIBES BY SPECIES ERADICATED, 1938
ST. JOE OPERATION

			Ribes by Species						
Working	Eradication Type	Acres	Ribes lacustre	Ribes viscosissimum	Ribes petiolare	Ribes inerme	Ribes irriguum	Ribes triste	Total Ribes
First	Open Reproduction	5,439	1,002,764	2,670,111	590		4,408		3,677,873
	Dense Reproduction	1,249	7,569	109,155			90		116,814
	Open Pole	8,094	860,309	658,844	225		3,220		1,522,598
	Dense Pole	294	4,592	30					4,622
	Open Mature	4,044	659,531	221,769	1,317		57,620		940,237
	All Upland	19,120	2,534,765	3,659,909	2,132		65,338		6,262,144
	Stream	579	931,153	10,173	180,667	4,114	266	132	1,126,505
	All Types	19,699	3,465,918	3,670,082	182,799	4,114	65,604	132	7,388,649
Second	Open Reproduction	18,677	1,416,467	1,916,643	26,071	7,884	1,266		3,368,331
	Dense Reproduction	1,250	45,650	58,101					103,751
	Open Pole	4,806	164,436	95,087	12	6			259,541
	Dense Pole	822	22,333	22,441					44,774
	Open Mature	2,033	101,854	235,824		19			337,697
	Dense Mature	188	4,434	7,388					11,822
	Cut Over	64	18						18
	All Upland	27,940	1,755,192	2,335,484	26,083	7,909	1,266		4,125,934
	Stream	1,849	482,309	21,716	337,197	31,038	1	140,815	1,013,076
	All Types	29,789	2,237,501	2,357,200	363,280	38,947	1,267	140,815	5,139,010
Third	Open Reproduction	263	1,852	5,967					7,819
	All Upland	263	1,852	5,967					7,819
	Stream	2,573	363,250	8,513	259,923	247,685			879,371
	All Types	2,836	365,102	14,480	259,923	247,685			887,190
All Workings	Open Reproduction	24,379	2,421,083	4,592,721	26,661	7,884	5,674		7,054,023
	Dense Reproduction	2,599	53,219	167,256			90		220,565
	Open Pole	12,900	1,024,745	753,931	237	6	3,220		1,782,139
	Dense Pole	1,116	26,925	22,471					49,396
	Open Mature	6,077	761,385	457,593	1,317	19	57,620		1,277,934
	Dense Mature	188	4,434	7,388					11,822
	Cut Over	64	18						18
	All Upland	47,323	4,291,809	6,001,360	28,215	7,909	66,604		10,395,897
	Stream	5,001	1,776,712	40,402	777,787	282,837	267	140,947	3,018,952
	All Types	52,324	6,068,521	6,041,762	806,002	290,746	66,871	140,947	13,414,849

SUMMARY OF RIBES ERADICATION, 1929-1938
ST. JOE OPERATION

TABLE NO. 8 - SUMMARY OF ALL WORKINGS

Eradication Type	Acres First Working	Acres Second Working	Acres Third Working	Total Acres	Effective Man Days	Total Ribes	Gallons Spray
Open Reproduction	157,913	26,018	263	184,194	226,009	77,376,845	
Dense Reproduction	42,896	1,831		44,727	11,706	1,859,573	
Open Pole	62,558	5,145		67,703	29,183	7,030,789	
Dense Pole	22,660	822		23,482	4,874	960,229	
Open Mature	181,099	4,745		185,844	76,797	21,557,279	
Dense Mature	9,745	274		10,019	1,614	267,557	
Cut Over	1,009	134		1,143	657	100,382	
Brush	2,452	332		2,784	1,888	677,365	
Burn	2,224			2,224	1,061	795,464	
Subalpine	200			200	416	90,809	
All Upland	482,756	39,301	263	522,320	354,205	110,716,292	
Stream (Hand)	34,153	9,810	4,084	48,047	84,809	25,137,077	
Stream (Chemical)	7,148	2,797	353	10,298	25,598	2,287,710	762,570
Stream (Slash)	791	27		818	10,420	409,100	
All Stream	34,944	9,837	4,084	48,865	120,827	27,833,887	
All Types	517,700	49,138	4,347	571,185	475,032	138,550,179	

TABLE NO. 8A - FIRST WORKING

Eradication Type	Acres	Effective Man Days	Total Ribes	Gallons Spray	Per Acre Basis Man Days	Ribes	Gallons Spray
Open Reproduction	157,913	201,251	72,939,779		1.27	462	
Dense Reproduction	42,896	10,956	1,732,968		.26	40	
Open Pole	62,558	27,294	6,759,022		.44	108	
Dense Pole	22,660	4,575	915,455		.20	40	
Open Mature	181,099	74,744	21,068,274		.41	116	
Dense Mature	9,745	1,559	255,434		.16	26	
Cut Over	1,009	654	100,332		.65	99	
Brush	2,452	1,881	676,620		.77	276	
Burn	2,224	1,061	795,464		.48	358	
Subalpine	200	416	90,809		2.08	454	
All Upland	482,756	324,391	105,334,157		.67	218	
Stream (Hand)	34,153	62,085	20,255,724		1.82	593	
Stream (Chemical)	7,148	21,016	1,950,240	650,080	2.94	273	91
Stream (Slash)	791	10,101	395,600		12.77	500	
All Stream	34,944	93,202	22,601,564		2.67	647	
All Types	517,700	417,593	127,935,721		.81	247	

TABLE NO. 8B - SECOND WORKING

Eradication Type	Acres	Effective Man Days	Total Ribes	Gallons Spray	Per Acre Basis Man Days	Ribes	Gallons Spray
Open Reproduction	26,018	24,615	4,429,247		.95	170	
Dense Reproduction	1,831	750	126,605		.41	69	
Open Pole	5,145	1,889	271,767		.37	53	
Dense Pole	822	299	44,774		.36	54	
Open Mature	4,745	2,053	489,005		.43	103	
Dense Mature	274	55	12,123		.20	44	
Cut Over	134	3	50		.02	1	
Brush	332	7	745		.02	2	
All Upland	39,301	29,671	5,374,316		.75	137	
Stream (Hand)	9,810	16,272	3,607,123		1.66	368	
Stream (Chemical)	2,797	4,260	307,809	102,603	1.52	110	37
Stream (Slash)	27	319	13,500		11.81	500	
All Stream	9,837	20,851	3,928,432		2.12	399	
All Types	49,138	50,522	9,302,748		1.03	189	

TABLE NO. 8C - THIRD WORKING

Eradication Type	Acres	Effective Man Days	Total Ribes	Gallons Spray	Per Acre Basis Man Days	Ribes	Gallons Spray
Open Reproduction	263	143	7,819		.54	30	
All Upland	263	143	7,819		.54	30	
Stream (Hand)	4,084	6,452	1,274,230		1.58	312	
Stream (Chemical)	353	322	29,661	9,887	.91	84	28
All Stream	4,084	6,774	1,303,891		1.66	319	
All Types	4,347	6,917	1,311,710		1.59	302	

TABLE NO. 9

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1929-1938
ST. JOE OPERATION

Working	Class	Acres	Effective Man Days	Total Ribes	Gallons Spray	Per Acre Basis: Man Days	Per Acre Basis: Ribes	Per Acre Basis: Gallons Per Sprayed Area
	FS-Reg.	76,088	71,205	22,468,171	257,907	.94	295	94
	EQ-NIRA	42,366	25,571	7,734,978	10,839	.60	183	68
	FS-NIRA	70,714	44,246	14,845,626	101,476	.63	210	129
	EQ-ERA	144,189	87,984	27,983,197	43,094	.61	194	113
First	FS-ERA	267	892	487,480		3.34	1,826	
	Cooperative	17,073	13,484	3,864,001	56,611	.79	226	41
	F-CCC	98,648	123,774	38,725,885	157,563	1.25	393	124
	S&P-CCC	68,355	50,437	11,826,383	22,590	.74	173	53
	Total	517,700	417,593	127,935,721	650,080	.81	247	91
	FS-Reg.	15,447	14,392	2,562,417	32,031	.93	166	27
	EQ-NIRA	1,742	1,228	291,131		.70	167	
	EQ-ERA	19,133	14,470	3,323,450	9,657	.76	174	33
Second	Cooperative	489	291	48,475	2,674	.60	99	11
	F-CCC	10,079	15,784	2,621,676	29,289	1.57	260	55
	S&P-CCC	2,248	4,357	455,599	28,952	1.94	203	54
	Total	49,138	50,522	9,302,748	102,603	1.03	189	37
	FS-Reg.	1,377	2,065	424,170	2,365	1.50	308	237
	EQ-ERA	981	1,307	341,204	3,025	1.33	348	12
Third	F-CCC	1,920	3,483	543,478	4,497	1.81	283	46
	S&P-CCC	69	62	2,858		.90	41	
	Total	4,347	6,917	1,311,710	9,887	1.59	302	28
	FS-Reg.	92,912	87,662	25,454,758	292,303	.94	274	74
	EQ-NIRA	44,108	26,799	8,026,109	10,839	.61	182	68
	FS-NIRA	70,714	44,246	14,845,626	101,476	.63	210	129
All	EQ-ERA	164,303	103,761	31,647,851	55,776	.63	193	60
Workings	FS-ERA	267	892	487,480		3.34	1,826	
	Cooperative	17,562	13,775	3,912,476	59,285	.78	223	36
	F-CCC	110,647	143,041	41,891,039	191,349	1.29	379	101
	S&P-CCC	70,672	54,856	12,284,840	51,542	.78	174	53
	Total	571,185	475,032	138,550,179	762,570	.83	243	74

TABLE NO.10

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1929-1938
ST. JOE OPERATION

Working	Number of Acres Worked by Ownership Classes: Federal: Forest Service	Federal: Public Domain	Federal: Total	State-Idaho	Private	Total
First	204,082	12,085	216,167	66,025	235,508	517,700
Second	27,139	1,681	28,820	4,721	15,597	49,138
Third	2,259	84	2,343	212	1,792	4,347
All Workings	233,480	13,850	247,330	70,958	252,897	571,185

TABLE NO. 11

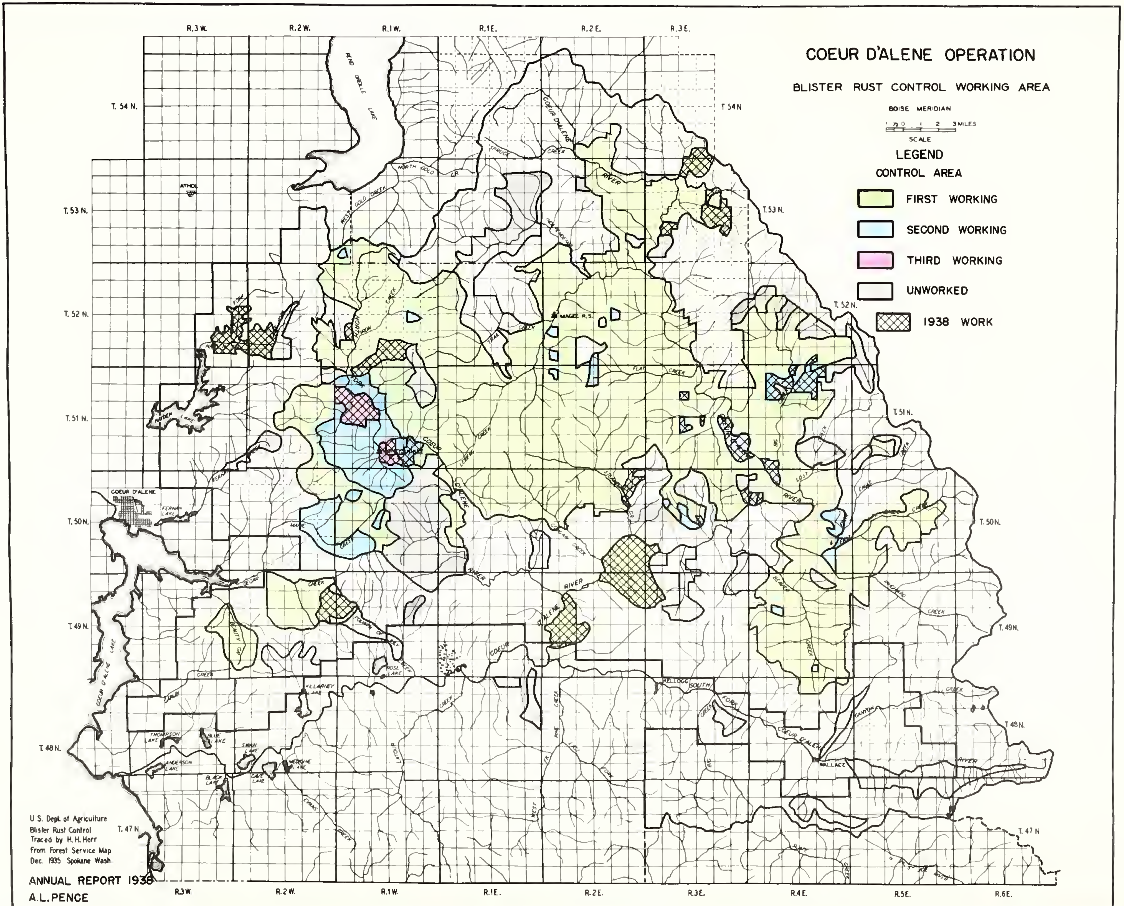
PROGRESS OF FIRST WORKING BY OWNERSHIP CLASSES, 1929-1938
ST. JOE OPERATION

Ownership Classes	Number of Acres: Worked	Unworked	Total
Forest Service	204,082	107,998	312,080
Public Domain	12,085	12,380	24,465
Sub-total Federal	216,167	120,378	336,545
State	66,025	48,910	114,935
Private	235,508	197,937	433,445
Total	517,700	367,225	884,925

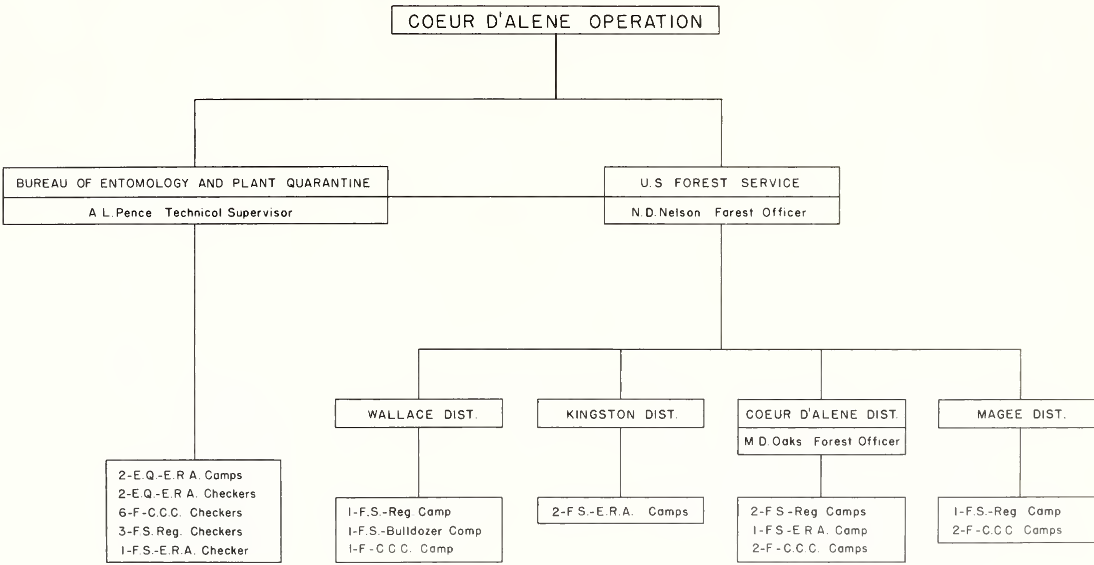
TABLE NO. 12

TOTAL RIBES BY SPECIES ERADICATED, 1929-1938
ST. JOE OPERATION

Working	Eradication Type	Acres	Ribes by Species						Total Ribes
			Ribes lacustre	Ribes viscosissimum	Ribes petiolare	Ribes inerme	Ribes irriguum	Ribes triste	
First	Open Reproduction	157,913	12,594,684	59,811,792	94,299	304,455	134,549		72,939,779
	Dense Reproduction	42,896	805,538	871,230	13,310	27,287	15,603		1,732,968
	Open Pole	62,558	2,724,120	3,876,779	19,835	61,506	76,782		6,759,022
	Dense Pole	22,660	454,627	457,299	1,335	1,993	201		915,455
	Open Mature	181,099	10,620,305	10,201,547	27,828	42,519	176,075		21,068,274
	Dense Mature	9,745	160,499	94,546	389				255,434
	Cut Over	1,009	64,897	30,125	5,269	41			100,332
	Brush	2,452	93,470	579,731	1,987	1,432			676,620
	Burn	2,224	133,557	652,633	8,327	947			795,464
	Subalpine	200	54,975	35,834					90,809
	All Upland	482,756	27,706,672	76,611,516	172,579	440,180	403,210		105,334,157
	Stream	34,944	15,745,938	849,277	3,268,025	2,721,559	16,633	132	22,601,564
	All Types	517,700	43,452,610	77,460,793	3,440,604	3,161,739	419,843	132	127,935,721
Second	Open Reproduction	26,018	1,845,280	2,545,521	26,401	7,902	4,143		4,429,247
	Dense Reproduction	1,831	55,990	70,615					126,605
	Open Pole	5,145	165,796	105,953	12	6			271,767
	Dense Pole	822	22,333	22,441					44,774
	Open Mature	4,745	165,438	318,082	31	19	5,435		489,005
	Dense Mature	274	4,629	7,494					12,123
	Cut Over	134	30			20			50
	Brush	332		745					745
	All Upland	39,301	2,259,496	3,070,851	26,444	7,947	9,578		5,374,316
	Stream	9,837	2,210,803	108,877	985,610	476,367	5,960	140,815	3,928,432
	All Types	49,138	4,470,299	3,179,728	1,012,054	484,314	15,538	140,815	9,302,748
Third	Open Reproduction	263	1,852	5,967					7,819
	All Upland	263	1,852	5,967					7,819
	Stream	4,084	565,853	21,515	380,191	336,332			1,303,891
	All Types	4,347	567,705	27,482	380,191	336,332			1,311,710
All Workings	Open Reproduction	184,194	14,441,816	62,363,280	120,700	312,357	138,692		77,376,845
	Dense Reproduction	44,727	861,528	941,845	13,310	27,287	15,603		1,859,573
	Open Pole	67,703	2,889,916	3,982,732	19,847	61,512	76,782		7,030,789
	Dense Pole	23,482	476,960	479,740	1,335	1,993	201		960,229
	Open Mature	185,844	10,785,743	10,519,629	27,859	42,538	181,510		21,557,279
	Dense Mature	10,019	165,128	102,040	389				267,557
	Cut Over	1,143	64,927	30,125	5,269	61			100,382
	Brush	2,784	93,470	580,476	1,987	1,432			677,365
	Burn	2,224	133,557	652,633	8,327	947			795,464
	Subalpine	200	54,975	35,834					90,809
	All Upland	522,320	29,968,020	79,688,334	199,023	448,127	412,788		110,716,292
	Stream	48,865	18,522,594	979,669	4,633,826	3,534,258	22,593	140,947	27,833,887
	All Types	571,185	48,490,614	80,668,003	4,832,849	3,982,385	435,381	140,947	138,550,179


COEUR D'ALENE OPERATION
BLISTER RUST CONTROL WORKING AREA
BOISE MERIDIAN
1/2 0 1 2 3 MILES
SCALE
LEGEND
CONTROL AREA
FIRST WORKING
SECOND WORKING
THIRD WORKING
UNWORKED
1938 WORK
R.3 W.
R.2 W.
R.1 W.
R.1 E.
R.2 E.
R.3 E.
R.4 E.
R.5 E.
R.6 E.
T. 54 N.
T. 53 N.
T. 52 N.
T. 51 N.
T. 50 N.
T. 49 N.
T. 48 N.
T. 47 N
PEND OREILLE LAKE
ATHOL
HAYDEN LAKE
COEUR D'ALENE
FERNAN LAKE
COEUR D'ALENE LAKE
MAGEE R.S.
KELLOGG
WALLACE
ROSE LAKE
KILLARNEY LAKE
THOMPSON LAKE
BLUE LAKE
SWAN LAKE
ANDERSON LAKE
BLACK LAKE
CAVE LAKE
MEDICINE LAKE
U.S. Dept. of Agriculture
Blister Rust Control
Traced by H. H. Horr
From Forest Service Map
Dec. 1935 Spokane Wash
ANNUAL REPORT 1938
A.L. PENCE

ORGANIZATION CHART



E.Q.-E.R.A.
Number of Camps - 2
Number of Men - 132

F.S.-E.R.A.
Number of Camps - 3
Number of Men - 120

F.S.-Reg.
Number of Camps - 5
Number of Men - 130

F.-C.C.C.
Number of Camps - 5
Number of Men - 500

Total Number of Men on Blister Rust Work - 882

[illegible]

Activity	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
		[illegible]			
		Total	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
		[illegible]	[illegible]	[illegible]	
		[illegible]			
		Total			
[illegible]	[illegible]	[illegible]	[illegible]		
		[illegible]		[illegible]	
		Total			
[illegible]	[illegible]	[illegible]		[illegible]	
		[illegible]		[illegible]	
		Total			[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]		[illegible]		[illegible]	
[illegible]		[illegible]	[illegible]	[illegible]	
Total Cost of [illegible] Program			[illegible]		

	[illegible]	[illegible]
Number of meals served	[illegible]	[illegible]
Average cost per meal	[illegible]	[illegible]
Pounds of [illegible] used	[illegible]	[illegible]

TABLE NO. 3 - SUMMARY OF ALL WORKINGS

Eradication Type	Acres First Working	Acres Second Working	Acres Third Working	Total Acres	Effective Man Days	Total Ribes	Ribes Remaining Per Acre	
							Bushes	Live Stem
Open Reproduction	7,942	771	479	9,192	14,431	1,889,983	4.1	7.4
Dense Reproduction	1,370			1,370	640	98,015	1.1	2.4
Open Pole	3,524	217	577	4,318	4,247	528,796	2.8	6.3
Dense Pole	821	33	92	946	134	15,261	1.8	2.0
Open Mature	3,510	2,204	1,445	7,159	6,262	1,025,924	3.3	9.3
Dense Mature		109		109	35	2,130	0.6	1.2
Cut Over	900	1,864	266	3,030	5,889	865,288	7.9	11.7
Brush	390	3		393	1,422	295,802	6.1	18.2
Burn	276			276	321	33,580	1.2	2.7
Meadow-Field	157			157				
All Upland	18,890	5,201	2,859	26,950	33,381	4,754,779	3.8	7.7
Stream (Hand)	592	1,061	302	1,955	3,875	667,804	4.6	8.5
Stream (Machine)		87		87	422	43,500		
Stream (Zone	118	2,257		2,375	1,797	145,760	1.6	6.8
All Stream	710	3,405	302	4,417	6,094	857,064	3.7	8.0
All Types	19,600	8,606	3,161	31,367	39,475	5,611,843	3.8	7.8

TABLE NO. 3A - FIRST WORKING

Eradication Type	Acres	Effective Man Days	Total Ribes	Per Acre Basis		Ribes Remaining Per Acre	
				Man Days	Ribes	Bushes	Live Stem
Open Reproduction	7,942	10,258	1,556,927	1.29	196	4.2	7.2
Dense Reproduction	1,370	640	98,015	.47	72	1.1	2.4
Open Pole	3,524	3,220	407,346	.91	116	2.9	6.5
Dense Pole	821	45	8,989	.05	11	2.4	2.4
Open Mature	3,510	3,598	806,596	1.03	229	3.0	9.6
Cut Over	900	1,594	419,681	1.77	466	5.8	17.6
Brush	390	1,421	295,581	3.64	758	6.0	17.9
Burn	276	321	33,580	1.16	122	1.2	2.7
Meadow-Field	157						
All Upland	18,890	21,097	3,626,715	1.12	192	3.5	7.6
Stream (Hand)	592	1,683	371,487	2.84	628	7.8	12.9
Stream (Zone)	118	147	15,402	1.25	131	1.5	7.7
All Stream	710	1,830	386,889	2.58	545	6.9	12.2
All Types	19,600	22,927	4,013,604	1.17	205	3.8	8.0

TABLE NO. 3B - SECOND WORKING

Open Reproduction	771	3,455	281,754	4.48	365	4.1	12.3
Open Pole	217	427	18,882	1.97	87	3.0	6.0
Dense Pole	33	18	1,197	.55	36	.5	1.2
Open Mature	2,204	1,980	118,501	.90	53	3.7	11.7
Dense Mature	109	35	2,130	.32	19	.6	1.2
Cut Over	1,864	3,343	332,042	1.79	178	9.2	10.4
Brush	3	1	221	.33	73	.3	1.7
All Upland	5,201	9,259	754,727	1.78	145	5.2	10.1
Stream (Hand)	1,061	1,916	278,748	1.81	263	3.5	6.6
Stream (Machine)	87	422	43,500	4.85	500		
Stream (Zone)	2,257	1,650	130,358	.73	58	1.6	6.7
All Stream	3,405	3,988	452,606	1.17	133	2.8	6.6
All Types	8,606	13,247	1,207,333	1.54	140	3.8	8.2

TABLE NO. 3C - THIRD WORKING

Open Reproduction	479	718	51,302	1.50	107	2.5	3.9
Open Pole	577	600	102,568	1.04	178	2.3	5.2
Dense Pole	92	71	5,075	.77	55	.3	1.3
Open Mature	1,445	684	100,827	.47	70	3.1	4.4
Cut Over	266	952	113,565	3.58	427	7.2	4.3
All Upland	2,859	3,025	373,337	1.06	130	3.5	4.4
Stream (Hand)	302	276	17,569	.91	58	2.5	8.4
All Stream	302	276	17,569	.91	58	2.5	8.4
All Types	3,161	3,301	390,906	1.04	123	3.3	5.1

TABLE NO. 4

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1938
COEUR D'ALENE OPERATION

Working	Class	Acres	Effective Man Days	Total Ribes	Per Acre Basis		Ribes Remaining Per Acre	
					Man Days	Ribes	Bushes	Live Stem
First	EQ-ERA	7,965	5,728	1,337,579	.72	168	2.1	7.2
	FS-ERA	2,742	4,248	544,035	1.55	198	6.5	16.6
	FS-Reg.	3,541	3,242	1,231,458	.92	348	6.5	7.8
	F-CCC	5,352	9,709	900,532	1.81	168	3.2	5.4
	Total	19,600	22,927	4,013,604	1.17	205	3.8	8.0
Second	FS-ERA	232	404	39,231	1.74	169	3.6	9.8
	FS-Reg.	2,596	1,712	233,114	.66	90	4.7	9.8
	FS-Bulldozer	87	422	43,500	4.85	500		
	F-CCC	5,691	10,709	891,488	1.88	157	3.4	7.4
	Total	8,606	13,247	1,207,333	1.54	140	3.8	8.2
Third	FS-Reg.	2,123	1,409	230,758	.66	109	1.7	4.6
	F-CCC	1,038	1,892	160,148	1.82	154	6.1	5.9
	Total	3,161	3,301	390,906	1.04	124	3.3	5.1
All Workings	EQ-ERA	7,965	5,728	1,337,579	.72	168	2.1	7.2
	FS-ERA	2,974	4,652	583,266	1.56	196	6.2	15.9
	FS-Reg.	8,260	6,363	1,695,330	.77	205	4.7	7.8
	FS-Bulldozer	87	422	43,500	4.85	500		
	F-CCC	12,081	22,310	1,952,168	1.85	162	3.6	6.4
	Total	31,367	39,475	5,611,843	1.26	179	3.8	7.8

TABLE NO. 5

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1938
COEUR D'ALENE OPERATION

State	Working	Number of Acres Worked									Total
		By Forest Service			By Bureau of Entomology and Plant Quarantine			Total			
		Forest Service	State	Private	Forest Service	State	Private	Forest Service	State	Private	
Idaho	First	10,768	87	780	2,863	1,855	3,247	13,631	1,942	4,027	19,600
	Second	6,780	120	1,706				6,780	120	1,706	8,606
	Third	2,721		440				2,721		440	3,161
	Total	20,269	207	2,926	2,863	1,855	3,247	23,132	2,062	6,173	31,367

TABLE NO. 6

RESULTS OF CHECKING ON AREAS WORKED, 1938
COEUR D'ALENE OPERATION

Eradication Type	Average Results for All Areas				Areas With More Than 25 Feet Live Stem Per Acre		
	Acres in Checked Area	Acres Checked	Ribes Per Acre		Acres	Per Acre	
			Bushes	Live Stem		Bushes	Live Stem
Open Reproduction	9,192	385	4.1	7.4	625	16.6	39.3
Dense Reproduction	1,370	55	1.1	2.4			
Open Pole	4,318	158	2.8	6.3	111	26.8	102.7
Dense Pole	946	35	2.4	2.7			
Open Mature	7,159	271	3.3	9.3	127	10.2	44.1
Dense Mature	109	5	.6	1.2			
Cut Over	3,030	119	8.0	12.0	557	15.3	35.3
Brush	393	16	6.1	18.2	72	26.0	81.7
Burn	276	10	1.2	2.7			
Meadow-Field	157	6					
All Upland	26,950	1,060	3.9	7.9	1,492	17.2	46.6
Stream (Hand)	1,955	591	2.0	3.7	30	22.5	79.2
Stream (Machine)	87						
Stream (Zone)	2,375	116	1.6	6.8			
All Stream	4,417	707	1.9	4.2	30	22.5	79.2
All Types	31,367	1,767	3.1	6.4	1,522	17.3	47.2

TABLE NO. 7

TOTAL RIBES BY SPECIES ERADICATED, 1938
COEUR D'ALENE OPERATION

Working	Eradication Type	Acres	Ribes by Species: Ribes lacustre	Ribes viscosissimum	Ribes inerme	Ribes irriguum	Total Ribes
First	Open Reproduction	7,942	655,160	887,172	9,472	5,123	1,556,927
	Dense Reproduction	1,370	28,428	69,577		10	98,015
	Open Pole	3,524	142,559	255,018	915	8,854	407,346
	Dense Pole	821	2,180	6,809			8,989
	Open Mature	3,510	554,280	251,309	5	1,002	806,596
	Cut Over	900	93,545	325,989	80	67	419,681
	Brush	390	87,444	207,466		671	295,581
	Burn	276	33,174	406			33,580
	Meadow-Field	157					
	All Upland	18,890	1,596,770	2,003,746	10,472	15,727	3,626,715
	Stream	710	231,829	10,009	127,219	17,832	386,889
	All Types	19,600	1,828,599	2,013,755	137,691	33,559	4,013,604
Second	Open Reproduction	771	37,001	242,028	705	2,020	281,754
	Open Pole	217	14,811	3,506		565	18,882
	Dense Pole	33	975	222			1,197
	Open Mature	2,204	103,496	12,858	6	2,141	118,501
	Dense Mature	109	1,670	235		225	2,130
	Cut Over	1,864	274,066	51,917	2,979	3,080	332,042
	Brush	3	221				221
	All Upland	5,201	432,240	310,766	3,690	8,031	754,727
	Stream	3,405	284,016	6,341	156,248	6,001	452,606
	All Types	8,606	716,256	317,107	159,938	14,032	1,207,333
Third	Open Reproduction	479	48,066	3,236			51,302
	Open Pole	577	91,845	10,723			102,568
	Dense Pole	92	5,075				5,075
	Open Mature	1,445	86,783	14,044			100,827
	Cut Over	266	80,383	33,182			113,565
	All Upland	2,859	312,152	61,185			373,337
	Stream	302	17,528	41			17,569
	All Types	3,161	329,680	61,226			390,906
All Workings	Open Reproduction	9,192	740,227	1,132,436	10,177	7,143	1,889,983
	Dense Reproduction	1,370	28,428	69,577		10	98,015
	Open Pole	4,313	249,215	269,247	915	9,419	528,796
	Dense Pole	946	8,230	7,031			15,261
	Open Mature	7,159	744,559	278,211	11	3,143	1,025,924
	Dense Mature	109	1,670	235		225	2,130
	Cut Over	3,030	447,994	411,088	3,059	3,147	865,288
	Brush	393	87,665	207,466		671	295,802
	Burn	276	33,174	406			33,580
	Meadow-Field	157					
	All Upland	26,950	2,341,162	2,375,697	14,162	23,758	4,754,779
	Stream	4,417	533,373	16,391	283,467	23,833	857,064
	All Types	31,367	2,874,535	2,392,088	297,629	47,591	5,611,843

TABLE NO. 8 - SUMMARY OF ALL WORKINGS

Eradication Type	Acres First Working	Acres Second Working	Acres Third Working	Total Acres	Effective Man Days	Total Ribes
Open Reproduction	66,247	3,796	479	70,522	123,820	17,908,695
Dense Reproduction	11,806	652		12,458	11,129	1,147,544
Open Pole	44,805	3,871	577	49,253	26,394	4,151,142
Dense Pole	16,130	228	92	16,450	4,261	598,666
Open Mature	128,281	8,496	1,445	138,222	92,571	14,932,046
Dense Mature	13,023	651		13,674	2,100	261,153
Cut Over	10,494	3,866	266	14,626	20,755	4,709,048
Brush	10,419	507		10,926	15,233	2,264,565
Burn	5,619			5,619	3,509	753,959
Subalpine	485			485	283	76,762
Meadow-Field	157			157		
All Upland	307,466	22,067	2,859	332,392	300,055	46,803,580
Stream (Hand)	12,801	3,039	302	16,142	54,416	11,643,432
Stream (Slash)	78	13		91	1,792	68,731
Stream (Machine)	1,045	87		1,132	5,038	566,000
Stream (Zone)	118	2,257		2,375	1,797	145,760
All Stream	14,042	5,396	302	19,740	63,043	12,423,923
All Types	321,508	27,463	3,161	352,132	363,098	59,227,503

TABLE NO. 8A - FIRST WORKING

Eradication Type	Acres	Effective Man Days	Total Ribes	Per Acre Basis Man Days	Per Acre Basis Ribes
Open Reproduction	66,247	113,688	16,991,562	1.72	256
Dense Reproduction	11,806	10,505	1,069,606	.89	91
Open Pole	44,805	23,139	3,574,035	.52	80
Dense Pole	16,130	4,104	586,618	.25	36
Open Mature	128,281	85,537	13,875,148	.67	108
Dense Mature	13,023	1,761	222,188	.14	17
Cut Over	10,494	13,693	3,846,728	1.30	367
Brush	10,419	14,499	2,166,698	1.39	208
Burn	5,619	3,509	753,959	.62	134
Subalpine	485	283	76,762	.58	158
Meadow-Field	157				
All Upland	307,466	270,718	43,163,304	.88	140
Stream (Hand)	12,801	47,321	10,680,449	3.70	834
Stream (Slash)	78	1,340	64,934	17.18	832
Stream (Machine)	1,045	4,616	522,500	4.42	500
Stream (Zone)	118	147	15,402	1.25	131
All Stream	14,042	53,424	11,283,285	3.80	804
All Types	321,508	324,142	54,446,589	1.01	169

TABLE NO. 8B - SECOND WORKING

Open Reproduction	3,796	9,414	865,831	2.48	228
Dense Reproduction	652	624	77,938	.96	120
Open Pole	3,871	2,655	474,539	.67	121
Dense Pole	228	86	6,973	.38	31
Open Mature	8,496	6,350	956,071	.75	113
Dense Mature	651	339	38,965	.52	60
Cut Over	3,866	6,110	748,755	1.58	194
Brush	507	734	97,867	1.45	193
All Upland	22,067	26,312	3,266,939	1.19	148
Stream (Hand)	3,039	6,819	945,417	2.24	311
Stream (Slash)	13	452	3,794	34.77	292
Stream (Machine)	87	422	43,500	4.85	500
Stream (Zone	2,257	1,650	130,358	.73	58
All Stream	5,396	9,343	1,123,069	1.73	208
All Types	27,463	35,655	4,390,008	1.30	160

TABLE NO. 8C - THIRD WORKING

Open Reproduction	479	718	51,302	1.50	107
Open Pole	577	600	102,568	1.04	178
Dense Pole	92	71	5,075	.77	55
Open Mature	1,445	684	100,827	.47	70
Cut Over	266	952	113,565	3.58	427
All Upland	2,859	3,025	373,337	1.06	131
Stream (Hand)	302	276	17,569	.91	58
All Types	3,161	3,301	390,906	1.04	124

TABLE NO. 9

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1927-1938
COEUR D'ALENE OPERATION

Working	Class	Acres	Effective Man Days	Total Ribes	Per Acre Basis	
					Man Days	Ribes
First	EQ-Reg.	25,776	8,351	2,846,383	.32	110
	FS-Reg.	32,990	31,508	6,330,712	.96	192
	FS-NIRA	86,083	59,504	13,399,102	.69	156
	EQ-ERA	40,997	35,497	6,584,066	.87	161
	FS-ERA	10,855	13,730	2,312,686	1.26	213
	F-CCC	124,807	175,552	22,973,640	1.41	184
	Total	321,508	324,142	54,446,589	1.01	169
Second	FS-Reg.	8,574	6,960	1,533,315	.81	179
	FS-NIRA	5,300	2,869	498,629	.54	94
	EQ-ERA	42	44	5,151	1.05	123
	FS-ERA	1,103	1,886	359,864	1.71	326
	F-CCC	12,444	23,896	1,993,049	1.92	160
	Total	27,463	35,655	4,390,008	1.30	160
Third	FS-Reg.	2,123	1,409	230,758	.66	109
	F-CCC	1,038	1,892	160,148	1.82	154
	Total	3,161	3,301	390,906	1.04	124
All Workings	EQ-Reg.	25,776	8,351	2,846,383	.32	110
	FS-Reg.	43,687	39,877	8,094,785	.91	185
	FS-NIRA	91,383	62,373	13,897,731	.68	152
	EQ-ERA	41,039	35,541	6,589,217	.87	161
	FS-ERA	11,958	15,616	2,672,550	1.31	223
	F-CCC	138,289	201,340	25,126,837	1.46	182
	Total	352,132	363,098	59,227,503	1.03	168

TABLE NO. 10

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1927-1938
COEUR D'ALENE OPERATION

Working	Number of Acres Worked by Ownership Classes			Total
	Forest Service	State - Idaho	Private	
First	304,604	5,214	11,690	321,508
Second	23,981	180	3,302	27,463
Third	2,721		440	3,161
All Workings	331,306	5,394	15,432	352,132

TABLE NO. 11

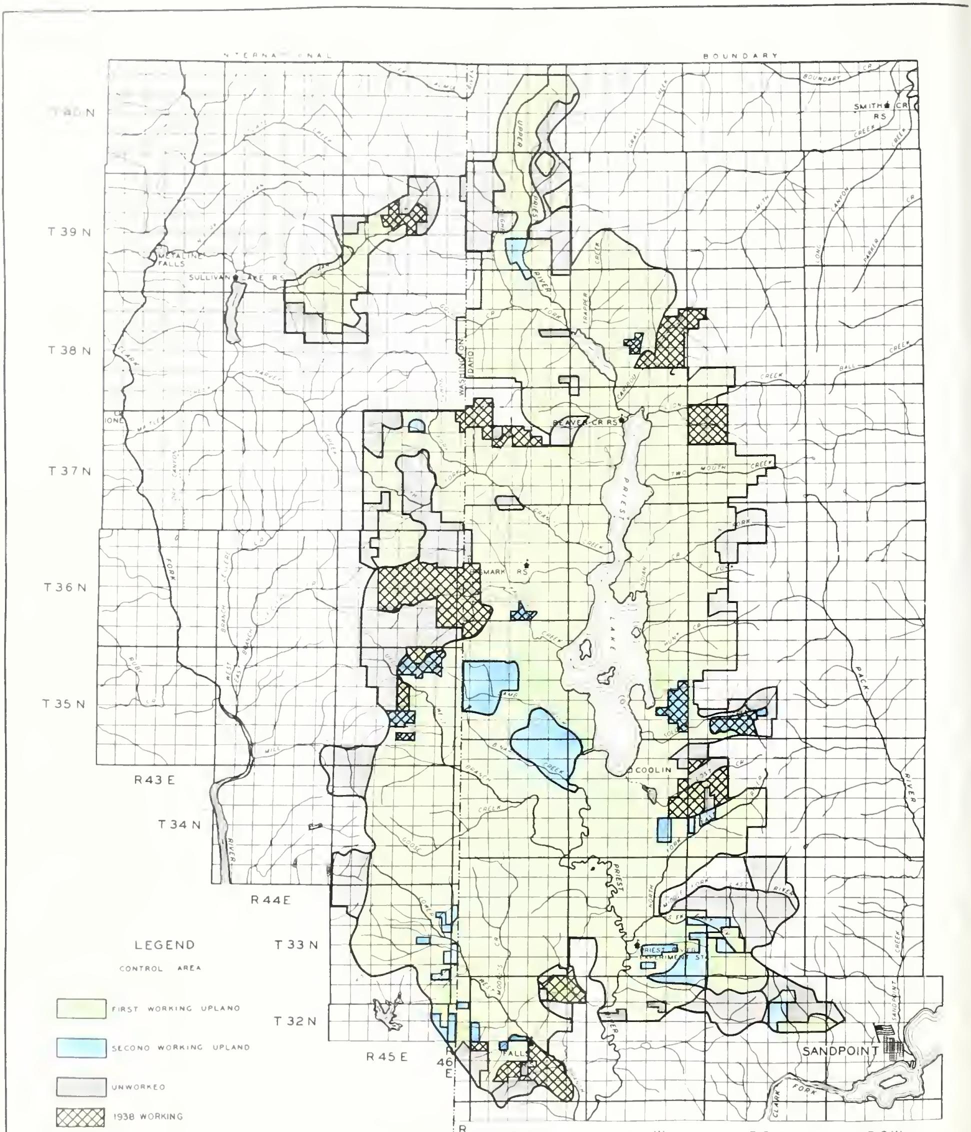
PROGRESS OF FIRST WORKING BY OWNERSHIP CLASSES, 1927-1938
COEUR D'ALENE OPERATION

Ownership Class	Number of Acres		
	Worked	Unworked	Total
Forest Service	304,604	55,546	360,150
Public Domain		2,110	2,110
Sub-total Federal	304,604	57,656	362,260
State - Idaho	5,214	1,541	6,755
Private	11,690	14,890	26,580
Total	321,508	74,087	395,595

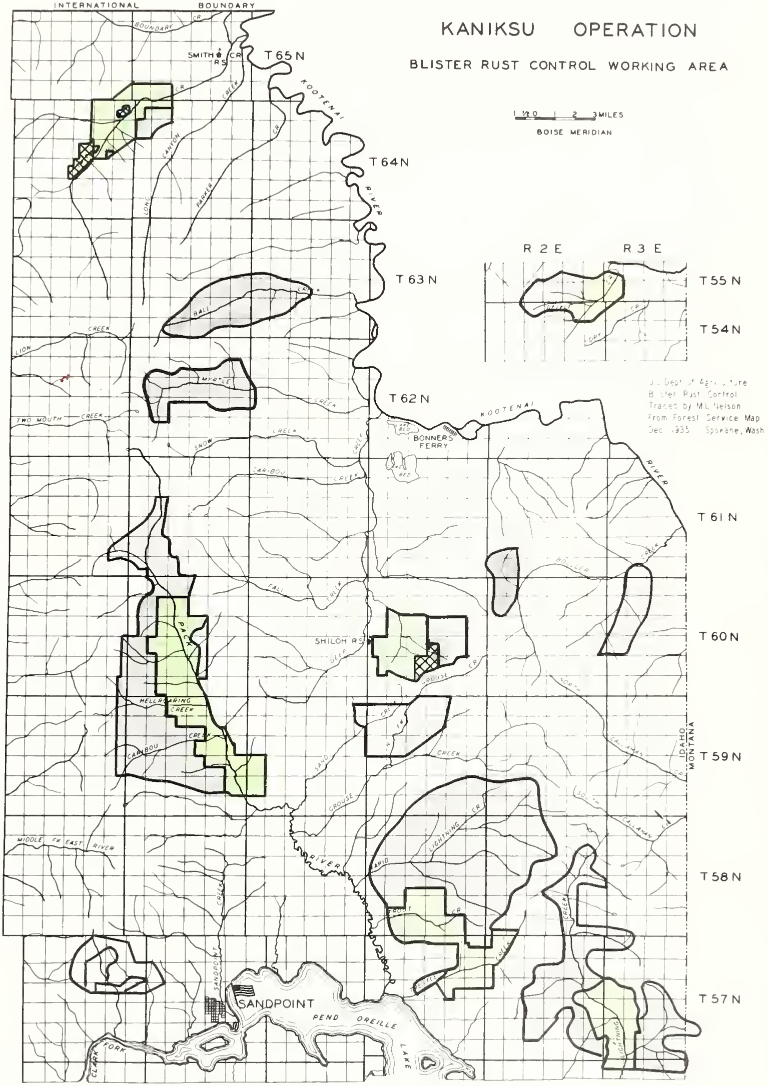
TABLE NO. 12

TOTAL RIBES BY SPECIES ERADICATED, 1927-1938
COEUR D'ALENE OPERATION

Working	Eradication Type	Acres	Ribes by Species					Total Ribes
			Ribes lacustre	Ribes viscosissimum	Ribes petiolare	Ribes inerme	Ribes irriguum	
First	Open Reproduction	66,247	9,871,892	6,523,071		497,844	98,755	16,991,562
	Dense Reproduction	11,806	658,872	402,833		5,323	2,578	1,069,606
	Open Pole	44,805	2,042,601	1,470,358	11,656	7,368	42,052	3,574,035
	Dense Pole	16,130	436,471	145,118		3,741	1,288	586,618
	Open Mature	128,281	10,803,434	2,842,433	1	79,617	149,663	13,875,148
	Dense Mature	13,023	193,735	17,816		9,778	859	222,188
	Cut Over	10,494	2,641,779	1,159,840	1	17,536	27,572	3,846,728
	Brush	10,419	769,734	1,365,959		25,748	5,257	2,166,698
	Burn	5,619	344,681	390,324		13,530	5,424	753,959
	Subalpine	485	55,561	21,201				76,762
	Meadow-Field	157						
	All Upland	307,466	27,818,760	14,338,953	11,658	660,485	333,448	43,163,304
	Stream	14,042	6,904,652	175,902	843	4,133,501	68,387	11,283,285
	All Types	321,508	34,723,412	14,514,855	12,501	4,793,986	401,835	54,446,589
Second	Open Reproduction	3,796	337,431	514,981		11,360	2,059	865,831
	Dense Reproduction	652	72,285	5,642		11		77,938
	Open Pole	3,871	381,345	84,011	4,736	3,882	565	474,539
	Dense Pole	228	6,484	489				6,973
	Open Mature	8,496	671,421	270,032		11,071	3,547	956,071
	Dense Mature	651	37,723	1,017			225	38,965
	Cut Over	3,866	598,541	133,704		13,430	3,080	748,755
	Brush	507	11,517	86,350				97,867
	All Upland	22,067	2,116,747	1,096,226	4,736	39,754	9,476	3,266,939
	Stream	5,396	750,894	41,194		324,980	6,001	1,123,069
	All Types	27,463	2,867,641	1,137,420	4,736	364,734	15,477	4,390,008
Third	Open Reproduction	479	48,066	3,236				51,302
	Open Pole	577	91,845	10,723				102,568
	Dense Pole	92	5,075					5,075
	Open Mature	1,445	86,783	14,044				100,827
	Cut Over	266	80,383	33,182				113,565
	All Upland	2,859	312,152	61,185				373,337
	Stream	302	17,528	41				17,569
	All Types	3,161	329,680	61,226				390,906
All Workings	Open Reproduction	70,522	10,257,389	7,041,288		509,204	100,814	17,908,695
	Dense Reproduction	12,458	731,157	408,475		5,334	2,578	1,147,544
	Open Pole	49,253	2,515,791	1,565,092	16,392	11,250	42,617	4,151,142
	Dense Pole	16,450	448,030	145,607		3,741	1,288	598,666
	Open Mature	138,222	11,561,638	3,126,509	1	90,688	153,210	14,932,046
	Dense Mature	13,674	231,458	18,833		9,778	1,084	261,153
	Cut Over	14,626	3,320,703	1,326,726	1	30,966	30,652	4,709,048
	Brush	10,926	781,251	1,452,309		25,748	5,257	2,264,565
	Burn	5,619	344,681	390,324		13,530	5,424	753,959
	Subalpine	485	55,561	21,201				76,762
	Meadow-Field	157						
	All Upland	332,392	30,247,659	15,496,364	16,394	700,239	342,924	46,803,580
	Stream	19,740	7,673,074	217,137	843	4,458,481	74,388	12,423,923
	All Types	352,132	37,920,733	15,713,501	17,237	5,158,720	417,312	59,227,503

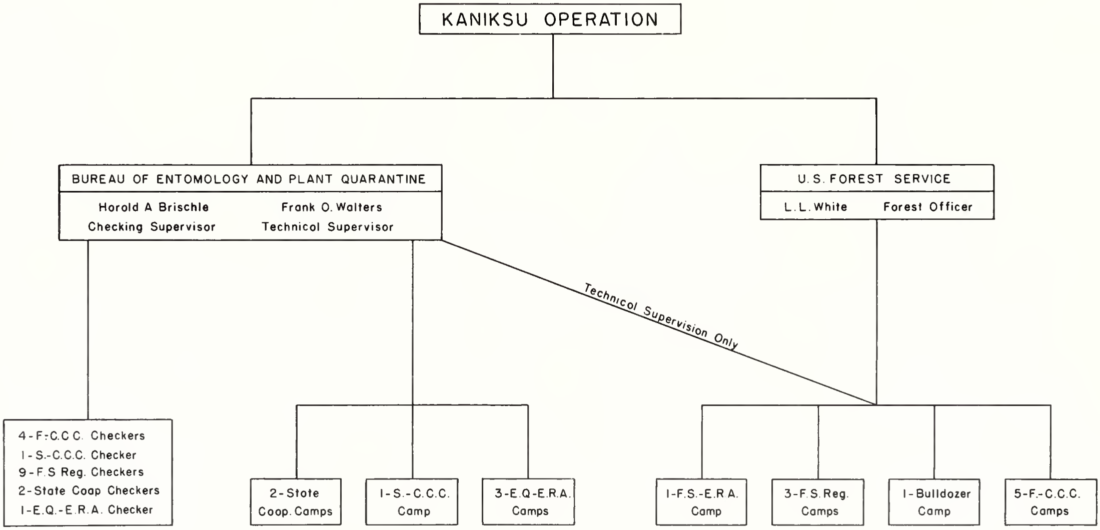


BOUNDARY
T 40 N
T 39 N
T 38 N
T 37 N
T 36 N
T 35 N
T 34 N
T 33 N
T 32 N
SMITH CR RS
METALINE FALLS
SULLIVAN LAKE RS
IONE
BEAVER CR RS
WASHINGTON
IDAHO
PRIEST LAKE
COOLIN
PRIEST RIVER EXPERIMENT STA
SANDPOINT
R43 E
R44E
R45 E
R 46 E
R 6 W
R 5 W
R 4 W
R 3 W
R 2 W
LEGEND
CONTROL AREA
FIRST WORKING UPLAND
SECOND WORKING UPLAND
UNWORKED
1938 WORKING



KANIKSU OPERATION
BLISTER RUST CONTROL WORKING AREA
BOISE MERIDIAN
INTERNATIONAL BOUNDARY
U.S. Dept. of Agriculture
Blister Rust Control
Traced by M.L. Nelson
From Forest Service Map
Dec. 1935 Spokane, Wash.
T 65 N
T 64 N
T 63 N
T 62 N
T 61 N
T 60 N
T 59 N
T 58 N
T 57 N
T 55 N
T 54 N
R 3 W
R 2 W
R 1 W
R 1 E
R 2 E
R 3 E
SMITH CR R.S.
SHILOH R.S.
BONNERS FERRY
SANDPOINT
PEND OREILLE LAKE
KOOTENAI RIVER
CLARK FORK
IDAHO
MONTANA

ORGANIZATION CHART



STATE COOP.
Number of Camps - 2
Number of Men - 66

E.Q.-E.R.A.
Number of Camps - 3
Number of Men - 200

F.S.-E.R.A.
Number of Camps - 1
Number of Men - 30

F.S.-REG.
Number of Camps - 4
Number of Men - 140

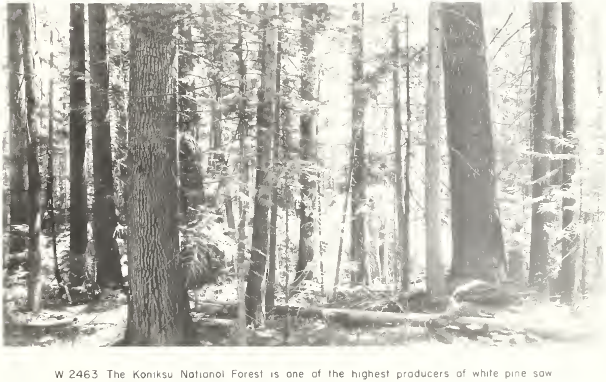
F.-C.C.C.
Number of Camps - 5
Number of Men - 540

S.-C.C.C.
Number of Camps - 1
Number of Men - 50

Total Number of Men on Blister Rust Work - 1,026

W 2424. Many fine plantations are thriving on the Kaniksu National Forest and the protection of these plantations is an important part of blister rust control work. Last season three camps worked in planted areas.

W 2465. Extensive pole stands of excellent white pine are to be found on the Kaniksu National Forest. These rapidly maturing stands of timber must be protected to insure the maintenance of the many industries in the Inland Empire dependent on white pine.



W 2463 The Kaniksu National Forest is one of the highest producers of white pine saw logs in Region One. Stands of all ages must be protected if stands such as this are to remain a reality.

TABLE NO. 1

EXPENDITURES BY APPROPRIATIONS, CALENDAR YEAR 1950
[illegible] OPERATION

Cooperating Agency	Appropriation	Amount
Forest Service	Regular	[illegible]
	ERA	[illegible]
	Total	[illegible]
Bureau of Entomology and Plant Quarantine	Regular	[illegible] 455 22
	ERA	[illegible]
	Total	[illegible]
State of Idaho	State [illegible] Fund	[illegible]
Total Expenditures	All Appropriations	[illegible]

TABLE NO. 2

CLASSIFIED EXPENDITURES, CALENDAR YEAR 1950
[illegible] OPERATION

[illegible]	[illegible]			[illegible]			[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Activity	Number Effective Man Days	Distribution of Cost	$	[illegible]
EQ ERA	9,[illegible]	EQ ERA	$ [illegible]	[illegible]
		EQ Reg.	[illegible]	
		Total	[illegible]	
FS ERA	1,229	FS Reg.	[illegible]	
		FS ERA	[illegible]	
		Total	[illegible]	
FS Reg.	2,080	FS Reg.	[illegible]	
		EQ ERA	[illegible]	
		EQ Reg.	[illegible]	
		Total	[illegible]	
State Camp	[illegible]	State	[illegible]	
		EQ ERA	[illegible]	
		Total	[illegible]	
CCC	[illegible]	FS Reg.	[illegible]	
		EQ ERA	[illegible]	
		EQ ERA	[illegible]	
		Total	[illegible]	
[illegible]	[illegible]	FS Reg.	[illegible]	
EQ ERA Winter Project	4,[illegible]	EQ ERA	[illegible]	
FS ERA Winter Project	[illegible] 532	FS ERA	[illegible]	
Total Cost of [illegible] Program			$ [illegible]	

	[illegible] Service	[illegible]
Number of meals served	[illegible]	[illegible]
Average cost per meal	$ .189	$ [illegible]
Pounds of twine	[illegible],100	[illegible]

SUMMARY OF RIBES ERADICATION, 1938
KANIKSU OPERATION

TABLE NO. 3 - SUMMARY OF ALL WORKINGS

Eradication Type	Acres First Working	Acres Second Working	Total Acres	Effective Man Days	Total Ribes	Ribes Remaining Per Acre	
						Bushes	Live Stem
Open Reproduction	14,315	1,860	16,175	21,863	5,071,359	4	9
Dense Reproduction	1,430	535	1,965	3,165	401,736	4	9
Open Pole	4,049	802	4,851	4,293	517,178	3	7
Dense Pole	130	84	214	188	14,928	1	4
Open Mature	6,877	1,727	8,604	3,666	416,016	1	3
Dense Mature	922	111	1,033	301	48,713	1	3
Brush		232	232	93	13,995	2	10
Subalpine	320		320	320	21,351	3	9
Meadow-Field	11	10	21	1	72		
All Upland	28,054	5,361	33,415	33,890	6,505,348	3	7
Stream (Hand)	1,056	119	1,175	3,128	335,008	3	13
Stream (Machine)	133		133	1,176	66,500		
All Stream	1,189	119	1,308	4,304	401,508	3	13
All Types	29,243	5,480	34,723	38,194	6,906,856	3	8

TABLE NO. 3A - FIRST WORKING

Eradication Type	Acres	Effective Man Days	Total Ribes	Per Acre Basis		Ribes Remaining Per Acre	
				Man Days	Ribes	Bushes	Live Stem
Open Reproduction	14,315	19,597	4,942,654	1.37	345	5	9
Dense Reproduction	1,430	2,711	364,609	1.90	255	3	11
Open Pole	4,049	3,511	473,657	.87	117	3	6
Dense Pole	130	120	14,634	.92	113	2	5
Open Mature	6,877	2,980	351,217	.43	51	1	3
Dense Mature	922	249	43,107	.27	47	1	4
Subalpine	320	320	21,351	1.00	67	3	9
Meadow-Field	11						
All Upland	28,054	29,488	6,211,229	1.05	221	3	7
Stream (Hand)	1,056	2,781	323,713	2.63	306	3	14
Stream (Machine)	133	1,176	66,500	8.84	500		
All Stream	1,189	3,957	390,213	3.32	328	3	14
All Types	29,243	33,445	6,601,442	1.14	225	3	8

TABLE NO. 3B - SECOND WORKING

Eradication Type	Acres	Effective Man Days	Total Ribes	Per Acre Basis Man Days	Per Acre Basis Ribes	Ribes Remaining Bushes	Ribes Remaining Live Stem
Open Reproduction	1,860	2,266	128,705	1.22	69	3	7
Dense Reproduction	535	454	37,127	.85	69	9	6
Open Pole	802	782	43,521	.97	54	4	15
Dense Pole	84	68	294	.81	3	1	2
Open Mature	1,727	686	64,799	.40	38	2	4
Dense Mature	111	52	5,606	.47	50		
Brush	232	93	13,995	.40	60	2	10
Meadow-Field	10	1	72	.10	7		
All Upland	5,361	4,402	294,119	.82	55	3	7
Stream (Hand)	119	347	11,295	2.91	95	4	11
All Stream	119	347	11,295	2.91	95	4	11
All Types	5,480	4,749	305,414	.87	56	3	7

TABLE NO. 4

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1938
KANIKSU OPERATION

State	Working	Class	Acres	Effective Man Days	Total Ribes	Per Acre Basis: Man Days	Per Acre Basis: Ribes	Ribes Remaining Per Acre: Bushes	Ribes Remaining Per Acre: Live Stem
Idaho	First	EQ-ERA	4,027	5,593	907,371	1.39	225		
		FS-ERA	1,303	1,232	144,046	.95	111		
		FS-Reg.	2,896	4,866	1,031,702	1.68	356		
		FS-Bulldozer	133	1,176	66,500	8.84	500		
		State Coop.	6,794	2,933	370,846	.43	55		
		F-CCC	5,288	7,293	1,307,737	1.38	247		
		Total	20,441	23,093	3,828,202	1.13	187		
	Second	State Coop.	364	264	12,504	.73	34		
		F-CCC	605	676	15,100	1.12	25		
		S-CCC	2,612	1,493	153,746	.57	59		
		Total	3,581	2,433	181,350	.68	51		
	All Workings	EQ-ERA	4,027	5,593	907,371	1.39	225		
		FS-ERA	1,303	1,232	144,046	.95	111		
		FS-Reg.	2,896	4,866	1,031,702	1.68	356		
		FS-Bulldozer	133	1,176	66,500	8.84	500		
		State Coop.	7,158	3,197	383,350	.45	54		
		F-CCC	5,893	7,969	1,322,837	1.35	224		
		S-CCC	2,612	1,493	153,746	.57	59		
		Total	24,022	25,526	4,009,552	1.06	167		
Washington	First	EQ-ERA	621	3,180	1,217,196	5.12	1,960		
		FS-Reg.	371	1,194	597,976	3.22	1,612		
		F-CCC	7,810	5,978	958,068	.77	123		
		Total	8,802	10,352	2,773,240	1.18	315		
	Second	EQ-ERA	817	865	56,862	1.06	70		
		F-CCC	1,082	1,451	67,202	1.34	62		
		Total	1,899	2,316	124,064	1.22	65		
	All Workings	EQ-ERA	1,438	4,045	1,274,058	2.81	886		
		FS-Reg.	371	1,194	597,976	3.21	1,612		
		F-CCC	8,892	7,429	1,025,270	.84	115		
		Total	10,701	12,668	2,897,304	1.18	270		
Idaho and Washington	First	EQ-ERA	4,648	8,773	2,124,567	1.89	457		
		FS-ERA	1,303	1,232	144,046	.95	111		
		FS-Reg.	3,267	6,060	1,629,678	1.85	499		
		FS-Bulldozer	133	1,176	66,500	8.84	500		
		State Coop.	6,794	2,933	370,846	.43	55		
		F-CCC	13,098	13,271	2,265,805	1.01	173		
		Total	29,243	33,445	6,601,442	1.14	226		
	Second	EQ-ERA	817	865	56,862	1.06	70		
		State Coop.	364	264	12,504	.73	34		
		F-CCC	1,687	2,127	82,302	1.26	49		
		S-CCC	2,612	1,493	153,746	.57	59		
		Total	5,480	4,749	305,414	.87	56		
	All Workings	EQ-ERA	5,465	9,638	2,181,429	1.76	399	4	9
		FS-ERA	1,303	1,232	144,046	.95	111		
		FS-Reg.	3,267	6,060	1,629,678	1.85	499	4	8
		FS-Bulldozer	133	1,176	66,500	8.84	500		
		State Coop.	7,158	3,197	383,350	.45	54	2	5
		F-CCC	14,785	15,398	2,348,107	1.04	159	3	9
		S-CCC	2,612	1,493	153,745	.57	59	3	5
		Total	34,723	38,194	6,906,856	1.10	199	3	8

TABLE NO. 5

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1938
KANIKSU OPERATION

State	Working	Number of Acres Worked: By Forest Service: Forest Service	By Forest Service: State	By Forest Service: Private	By Bureau of Entomology and Plant Quarantine: Forest Service	By Bureau of Entomology and Plant Quarantine: State	By Bureau of Entomology and Plant Quarantine: Private	Total: Forest Service	Total: State	Total: Private	Total
Idaho	First	8,329		1,232	976	7,738	2,166	9,305	7,738	3,398	20,441
	Second	272		333		2,976		272	2,976	333	3,581
	Total	8,601		1,565	976	10,714	2,166	9,577	10,714	3,731	24,022
Washington	First	7,232	640	306	175		449	7,407	640	755	8,802
	Second	880		200	446		373	1,326		573	1,899
	Total	8,112	640	506	621		822	8,733	640	1,328	10,701
Total	First	15,561	640	1,538	1,151	7,738	2,615	16,712	8,378	4,153	29,243
	Second	1,152		533	446	2,976	373	1,598	2,976	906	5,480
	Total	16,713	640	2,071	1,597	10,714	2,988	18,310	11,354	5,059	34,723

TABLE NO. 6

RESULTS OF CHECKING ON AREAS WORKED, 1938
KANIKSU OPERATION

Eradication Type	Average Results for All Areas			
	Acres in Checked Area	Acres Checked	Ribes Per Acre	
			Bushes	Live Stem
Open Reproduction	15,932	638	4	9
Dense Reproduction	1,661	67	4	9
Open Pole	4,724	189	3	7
Dense Pole	219	8	1	4
Open Mature	8,435	337	1	3
Dense Mature	918	36	1	3
Brush	232	9	2	10
Subalpine	320	13	3	9
Meadow-Field	26	1		
All Upland	32,467	1,298	3	7
Stream	1,170	249	3	13
All Types	33,637	1,547	3	8

TABLE NO. 7

TOTAL RIBES BY SPECIES ERADICATED, 1938
KANIKSU OPERATION

Working	Eradication Type	Acres	Ribes by Species			Total Ribes
			Ribes lacustre	Ribes viscosissimum	Ribes inerme	
First	Open Reproduction	14,315	905,476	4,033,640	3,538	4,942,654
	Dense Reproduction	1,430	297,499	67,110		364,609
	Open Pole	4,049	162,840	309,300	1,517	473,657
	Dense Pole	130	4,805	9,829		14,634
	Open Mature	6,877	209,132	141,543	542	351,217
	Dense Mature	922	23,727	19,380		43,107
	Subalpine	320	21,351			21,351
	Meadow-Field	11				
	All Upland	28,054	1,624,830	4,580,802	5,597	6,211,229
	Stream	1,189	236,485	38,137	115,591	390,213
	All Types	29,243	1,861,315	4,618,939	121,188	6,601,442
Second	Open Reproduction	1,860	58,104	70,460	141	128,705
	Dense Reproduction	535	26,373	10,754		37,127
	Open Pole	802	17,472	26,049		43,521
	Dense Pole	84	274	20		294
	Open Mature	1,727	37,026	27,761	12	64,799
	Dense Mature	111	3,996	1,610		5,606
	Brush	232	7,582	6,413		13,995
	Meadow-Field	10	72			72
	All Upland	5,361	150,899	143,067	153	294,119
	Stream	119	5,847	650	4,798	11,295
	All Types	5,480	156,746	143,717	4,951	305,414
All Workings	Open Reproduction	16,175	963,580	4,104,100	3,679	5,071,359
	Dense Reproduction	1,965	323,872	77,864		401,736
	Open Pole	4,851	180,312	335,349	1,517	517,178
	Dense Pole	214	5,079	9,849		14,928
	Open Mature	8,604	246,158	169,304	554	416,016
	Dense Mature	1,033	27,723	20,990		48,713
	Brush	232	7,582	6,413		13,995
	Subalpine	320	21,351			21,351
	Meadow-Field	21	72			72
	All Upland	33,415	1,775,729	4,723,869	5,750	6,505,348
	Stream	1,308	242,332	38,787	120,389	401,508
	All Types	34,723	2,018,061	4,762,656	126,139	6,906,856

SUMMARY OF RIBES ERADICATION, 1923-1938
KANIKSU OPERATION

TABLE NO. 8 - SUMMARY OF ALL WORKINGS

Eradication Type	Acres First Working	Acres Second Working	Total Acres	Effective Man Days	Total Ribes
Open Reproduction	122,281	7,532	129,813	84,718	23,962,241
Dense Reproduction	22,455	1,551	24,006	12,558	1,754,663
Open Pole	90,149	8,436	98,585	31,120	4,409,766
Dense Pole	19,513	1,689	21,202	3,694	389,351
Open Mature	107,891	3,379	111,270	26,813	5,224,863
Dense Mature	30,190	236	30,426	3,620	421,223
Cut Over	5,293	264	5,557	1,808	538,842
Brush	3,599	562	4,161	1,374	361,001
Burn	1,132		1,132	1,354	947,874
Subalpine	1,933	50	1,983	1,032	157,110
Meadow-Field	71	10	81	1	72
All Upland	404,507	23,709	428,216	168,092	38,167,006
Stream (Hand)	19,364	3,472	22,836	39,290	8,149,207
Stream (Slash)	576		576	4,994	288,000
Stream (Machine)	890		890	6,050	544,076
All Stream	20,830	3,472	24,302	50,334	8,981,283
All Types	425,337	27,181	452,518	218,426	47,148,289

TABLE NO. 8A - FIRST WORKING

Eradication Type	Acres	Effective Man Days	Total Ribes	Per Acre Basis	
				Man Days	Ribes
Open Reproduction	122,281	78,477	23,126,172	.64	189
Dense Reproduction	22,455	11,602	1,692,817	.52	75
Open Pole	90,149	27,901	4,175,603	.31	46
Dense Pole	19,513	3,263	357,735	.17	18
Open Mature	107,891	24,982	5,029,559	.23	47
Dense Mature	30,190	3,504	410,261	.12	14
Cut Over	5,293	1,707	527,750	.32	100
Brush	3,599	1,104	336,107	.31	93
Burn	1,132	1,354	947,874	1.20	837
Subalpine	1,933	1,019	156,522	.53	81
Meadow-Field	71				
All Upland	404,507	154,913	36,760,400	.38	91
Stream (Hand)	19,364	33,141	7,475,483	1.71	386
Stream (Slash)	576	4,994	288,000	8.67	500
Stream (Machine)	890	6,050	544,076	6.80	611
All Stream	20,830	44,185	8,307,559	2.12	399
All Types	425,337	199,098	45,067,959	.47	106

TABLE NO. 8B - SECOND WORKING

Eradication Type	Acres	Effective Man Days	Total Ribes	Man Days	Ribes
Open Reproduction	7,532	6,241	836,069	.83	111
Dense Reproduction	1,551	956	61,846	.62	40
Open Pole	8,436	3,219	234,163	.38	28
Dense Pole	1,689	431	31,616	.26	19
Open Mature	3,379	1,831	195,304	.54	58
Dense Mature	236	116	10,962	.49	46
Cut Over	264	101	11,092	.38	42
Brush	562	270	24,894	.48	44
Subalpine	50	13	588	.26	12
Meadow-Field	10	1	72	.10	7
All Upland	23,709	13,179	1,406,606	.55	59
Stream (Hand)	3,472	6,149	673,724	1.77	194
All Stream	3,472	6,149	673,724	1.77	194
All Types	27,181	19,328	2,080,330	.71	77

TABLE NO. 9

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1923-1938
KANIKSU OPERATION

State	Working	Class	Acres	Effective Man Days	Total Ribes	Per Acre Basis Man Days	Per Acre Basis Ribes
Idaho	First	EQ-Reg.	18,796	6,844	1,066,689	.36	57
		FS-Reg.	5,684	10,609	1,907,317	1.87	336
		FS-NIRA	72,135	23,866	6,432,376	.33	89
		EQ-ERA	70,864	36,135	6,377,280	.51	90
		FS-ERA	15,521	9,922	1,851,208	.64	119
		Cooperative	105,717	28,054	8,051,805	.27	76
		F-CCC	54,094	35,149	5,981,923	.65	111
		S&P-CCC	112	748	209,356	6.68	1,869
		Total	342,923	151,327	31,877,954	.44	93
	Second	FS-NIRA	8,544	2,051	292,658	.24	34
		EQ-ERA	7,928	6,065	980,061	.76	124
		FS-ERA	1,181	762	76,228	.64	64
		Cooperative	611	393	35,178	.64	58
		F-CCC	2,064	4,300	182,234	2.08	88
		S&P-CCC	2,612	1,493	153,746	.57	59
		Total	22,940	15,064	1,720,105	.66	75
	All Workings	EQ-Reg.	18,796	6,844	1,066,689	.36	57
		FS-Reg.	5,684	10,609	1,907,317	1.87	336
		FS-NIRA	80,679	25,917	6,725,034	.32	83
		EQ-ERA	78,792	42,200	7,357,341	.54	93
		FS-ERA	16,702	10,684	1,927,436	.64	115
		Cooperative	106,328	28,447	8,086,983	.27	76
		F-CCC	56,158	39,449	6,164,157	.70	110
		S&P-CCC	2,724	2,241	363,102	.82	133
		Total	365,863	166,391	33,598,059	.45	92
Washington	First	FS-Reg.	584	2,237	704,476	3.83	1,206
		EQ-NIRA	26,733	11,711	4,348,258	.44	163
		FS-NIRA	34,417	12,708	3,858,496	.37	112
		EQ-ERA	2,921	4,635	1,832,794	1.59	627
		F-CCC	17,759	16,480	2,445,981	.93	138
		Total	82,414	47,771	13,190,005	.58	160
	Second	EQ-ERA	1,210	1,135	138,259	.94	114
		FS-ERA	1,949	1,678	154,764	.86	79
		F-CCC	1,082	1,451	67,202	1.34	62
		Total	4,241	4,264	360,225	1.00	85
	All Workings	FS-Reg.	584	2,237	704,476	3.83	1,206
		EQ-NIRA	26,733	11,711	4,348,258	.44	163
		FS-NIRA	34,417	12,708	3,858,496	.37	112
		EQ-ERA	4,131	5,770	1,971,053	1.40	477
		FS-ERA	1,949	1,678	154,764	.86	79
		F-CCC	18,841	17,931	2,513,183	.95	133
		Total	86,655	52,035	13,550,230	.60	156
Idaho and Washington	First	EQ-Reg.	18,796	6,844	1,066,689	.36	57
		FS-Reg.	6,268	12,846	2,611,793	2.05	417
		EQ-NIRA	26,733	11,711	4,348,258	.44	163
		FS-NIRA	106,552	36,574	10,290,872	.34	97
		EQ-ERA	73,785	40,770	8,210,074	.55	111
		FS-ERA	15,521	9,922	1,851,208	.64	119
		Cooperative	105,717	28,054	8,051,805	.27	76
		F-CCC	71,853	51,629	8,427,904	.72	117
		S&P-CCC	112	748	209,356	6.68	1,869
		Total	425,337	199,098	45,067,959	.47	106
	Second	FS-NIRA	8,544	2,051	292,658	.24	34
		EQ-ERA	9,138	7,200	1,118,320	.79	122
		FS-ERA	3,130	2,440	230,992	.78	74
		Cooperative	611	393	35,178	.64	58
		F-CCC	3,146	5,751	249,436	1.83	79
		S&P-CCC	2,612	1,493	153,746	.57	59
		Total	27,181	19,328	2,080,330	.71	77
	All Workings	EQ-Reg.	18,796	6,844	1,066,689	.36	57
		FS-Reg.	6,268	12,846	2,611,793	2.05	417
		EQ-NIRA	26,733	11,711	4,348,258	.44	163
		FS-NIRA	115,096	38,625	10,583,530	.34	92
		EQ-ERA	82,923	47,970	9,328,394	.58	112
		FS-ERA	18,651	12,362	2,082,200	.66	112
		Cooperative	106,328	28,447	8,086,983	.27	76
		F-CCC	74,999	57,380	8,677,340	.76	116
		S&P-CCC	2,724	2,241	363,102	.82	133
		Total	452,518	218,426	47,148,289	.48	104

TABLE NO. 10

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1923-1938
KANIKSU OPERATION

State	Working	Number of Acres Worked by Ownership Classes					Total
		Federal			State	Private	
		Forest Service	Public Domain	Total			
Idaho	First	176,115	54	176,169	101,376	65,378	342,923
	Second	11,789		11,789	6,862	4,289	22,940
	All Workings	187,904	54	187,958	108,238	69,667	365,863
Washington	First	48,790		48,790	2,030	31,594	82,414
	Second	2,762		2,762		1,479	4,241
	All Workings	51,552		51,552	2,030	33,073	86,655
Idaho and Washington	First	224,905	54	224,959	103,406	96,972	425,337
	Second	14,551		14,551	6,862	5,768	27,181
	All Workings	239,456	54	239,510	110,268	102,740	452,518

TABLE NO. 11

PROGRESS OF FIRST WORKING BY OWNERSHIP CLASSES, 1923-1938
KANIKSU OPERATION

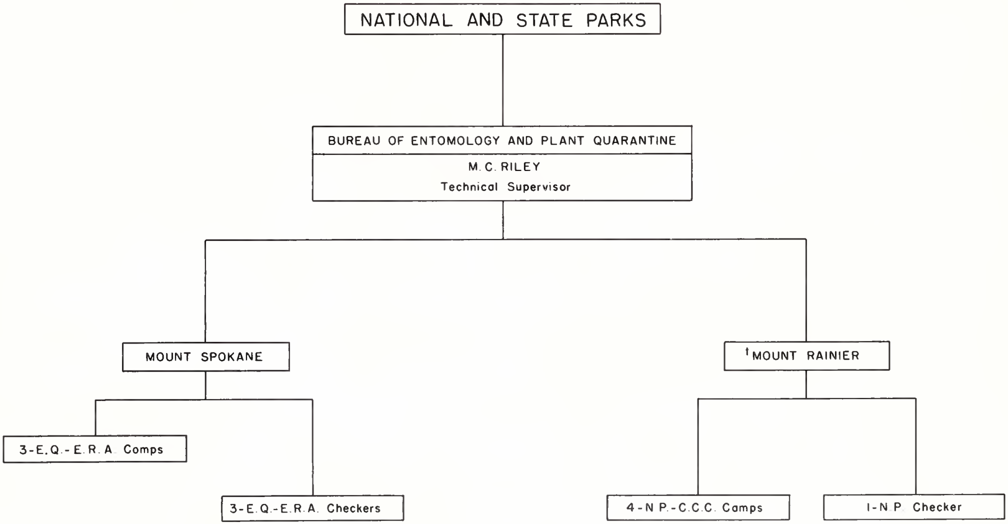
State	Ownership Class	Number of Acres		
		Worked	Unworked	Total
Idaho	Forest Service	176,115	78,770	254,885
	Public Domain	54	506	560
	Sub-total Federal	176,169	79,276	255,445
	State	101,376	27,094	128,470
	Private	65,378	52,332	117,710
	Total	342,923	158,702	501,625
Washington	Forest Service	48,790	43,100	91,890
	State	2,030	2,080	4,110
	Private	31,594	14,051	45,645
	Total	82,414	59,231	141,645
Idaho and Washington	Forest Service	224,905	121,870	346,775
	Public Domain	54	506	560
	Sub-total Federal	224,959	122,376	347,335
	State	103,406	29,174	132,580
	Private	96,972	66,383	163,355
	Total	425,337	217,933	643,270

TABLE NO. 12

TOTAL RIBES BY SPECIES ERADICATED, 1923-1938
KANIKSU OPERATION

Working	Eradication Type	Acres	Ribes by Species					Total
			Ribes lacustre	Ribes viscosissimum	Ribes inerme	Ribes irriguum	Ribes acerifolium	
First	Open Reproduction	122,281	6,382,370	16,588,789	152,066	2,947		23,126,172
	Dense Reproduction	22,455	1,228,309	398,213	66,295			1,692,817
	Open Pole	90,149	1,987,771	1,977,179	185,547	21,192	3,914	4,175,603
	Dense Pole	19,513	234,053	100,772	22,388	522		357,735
	Open Mature	107,891	3,489,416	1,415,392	122,722		2,027	5,029,559
	Dense Mature	30,190	290,642	87,880	31,739			410,261
	Cut Over	5,293	222,312	262,218	43,220			527,750
	Brush	3,599	68,387	203,158	64,562			336,107
	Burn	1,132	153,516	790,402	3,956			947,874
	Subalpine	1,933	116,392	40,111	19			156,522
	Meadow-Field	71						
	All Upland	404,507	14,173,170	21,864,114	692,514	24,661	5,941	36,760,400
	Stream	20,830	4,160,536	373,257	3,754,182		19,584	8,307,559
	All Types	425,337	16,333,706	22,237,371	4,446,696	24,661	25,525	45,067,959
Second	Open Reproduction	7,532	290,088	523,896	22,085			836,069
	Dense Reproduction	1,551	46,225	14,103	1,518			61,846
	Open Pole	8,436	135,768	90,548	7,847			234,163
	Dense Pole	1,689	26,455	2,685	2,476			31,616
	Open Mature	3,379	109,702	82,386	3,216			195,304
	Dense Mature	236	7,967	2,337	658			10,962
	Cut Over	264	2,603	270	8,219			11,092
	Brush	562	12,693	11,326	875			24,894
	Subalpine	50	461	127				588
	Meadow-Field	10	72					72
	All Upland	23,709	632,034	727,678	46,894			1,406,606
	Stream	3,472	255,923	24,349	393,452			673,724
	All Types	27,181	887,957	752,027	440,346			2,080,330
All Workings	Open Reproduction	129,813	6,672,458	17,112,685	174,151	2,947		23,962,241
	Dense Reproduction	24,006	1,274,534	412,316	67,813			1,754,663
	Open Pole	98,585	2,123,539	2,067,727	193,394	21,192	3,914	4,409,766
	Dense Pole	21,202	260,508	103,457	24,864	522		389,351
	Open Mature	111,270	3,599,120	1,497,778	125,938		2,027	5,224,863
	Dense Mature	30,426	298,609	90,217	32,397			421,223
	Cut Over	5,557	224,915	262,488	51,439			538,842
	Brush	4,161	81,080	214,484	65,437			361,001
	Burn	1,132	153,516	790,402	3,956			947,874
	Subalpine	1,983	116,853	40,238	19			157,110
	Meadow-Field	81	72					72
	All Upland	428,216	14,805,204	22,591,792	739,408	24,661	5,941	38,167,006
	Stream	24,302	4,416,459	397,606	4,147,634		19,584	8,981,283
	All Types	452,518	19,221,663	22,989,398	4,887,042	24,661	25,525	47,148,289

ORGANIZATION CHART



E.Q.-E.R.A.
Number of Comps - 3
Number of Men - 240

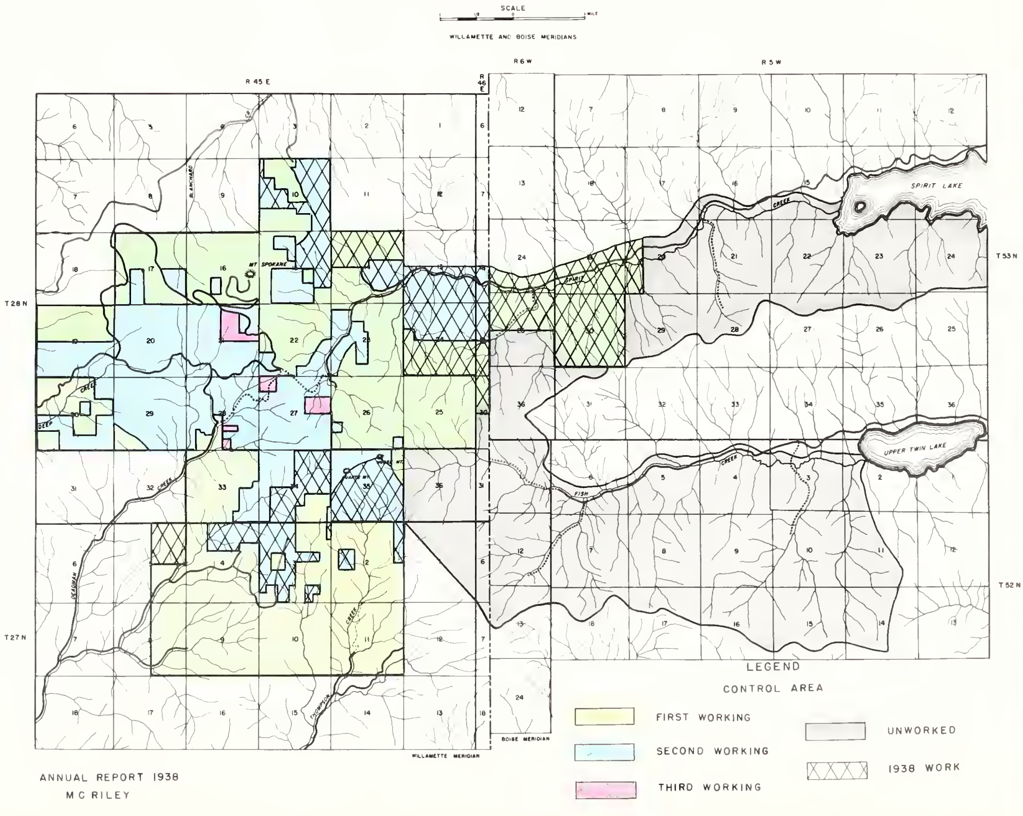
N.P.-C.C.C.
Number of Camps - 4
Number of Men - 50

Total Number of Men on Blister Rust Work — 290

† Separate Report on Mount Roinier Work

MT. SPOKANE OPERATION

BLISTER RUST CONTROL WORKING AREA



ANNUAL REPORT 1938

M C RILEY

[illegible]

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Bureau of Entomology and Plant Quarantine	Total	[illegible]
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[illegible]

[illegible]

	Bureau of [illegible] Plant [illegible]	
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Other expenses	[illegible]	
Total	[illegible]	[illegible]

[illegible]

SUMMARY OF RIBES ERADICATION, 1938
MOUNT SPOKANE OPERATION

TABLE NO. 3 - SUMMARY OF ALL WORKINGS

Eradication Type	Acres First Working	Acres Second Working	Total Acres	Effective Man Days	Total Ribes	Ribes Remaining Per Acre	
						Bushes	Live Stem
Open Reproduction	1,706	1,158	2,864	7,190	2,408,497	5.7	6.7
Dense Reproduction	53	69	122	116	12,463	3.1	2.5
Open Pole	202	1,089	1,291	1,999	533,611	3.4	4.8
Dense Pole		74	74	25	4,775	1.0	1.7
Open Mature	58	257	315	632	153,525	15.6	7.8
Dense Mature		32	32	6	503		
Brush	449	65	514	615	81,753	1.0	1.6
Subalpine		4	4	2	96		
All Upland	2,468	2,748	5,216	10,585	3,195,223	5.0	5.5
Stream (Hand)	108	140	248	897	327,499	1.9	4.7
All Types	2,576	2,888	5,464	11,482	3,522,722	4.8	5.4

TABLE NO. 3A - FIRST WORKING

Eradication Type	Acres	Effective Man Days	Total Ribes	Per Acre Basis		Ribes Remaining Per Acre	
				Man Days	Ribes	Bushes	Live Stem
Open Reproduction	1,706	5,922	2,139,582	3.47	1,254	5.7	7.3
Dense Reproduction	53	92	11,535	1.74	218	5.0	5.0
Open Pole	202	889	276,276	4.40	1,368	7.3	12.9
Open Mature	58	245	61,859	4.22	1,067	4.3	7.8
Brush	449	303	36,506	.67	81	.2	.5
All Upland	2,468	7,451	2,525,758	3.02	1,023	4.8	6.5
Stream (Hand)	108	632	282,102	5.85	2,612	1.9	4.6
All Types	2,576	8,083	2,807,860	3.14	1,090	4.4	6.3

TABLE NO. 3B - SECOND WORKING

Open Reproduction	1,158	1,268	268,915	1.09	232	5.6	5.8
Dense Reproduction	69	24	928	.35	13	1.5	.4
Open Pole	1,089	1,110	257,335	1.02	236	2.8	3.4
Dense Pole	74	25	4,775	.34	65	1.0	1.7
Open Mature	257	387	91,666	1.51	357	18.5	7.8
Dense Mature	32	6	503	.19	16		
Brush	65	312	45,247	4.80	696	6.1	8.0
Subalpine	4	2	96	.50	24		
All Upland	2,748	3,134	669,465	1.14	244	5.2	4.6
Stream (Hand)	140	265	45,397	1.89	324	2.4	5.6
All Types	2,888	3,399	714,862	1.18	248	5.1	4.6

TABLE NO. 4

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1938
MOUNT SPOKANE OPERATION

State	Working	Class	Acres	Effective Man Days	Total Ribes	Per Acre Basis		Ribes Remaining Per Acre	
						Man Days	Ribes	Bushes	Live Stem
Idaho	First	EQ-ERA	1,651	4,711	1,414,951	2.85	857	4.1	8.3
Washington	First	EQ-ERA	925	3,372	1,392,909	3.65	1,506	6.0	6.2
	Second	EQ-ERA	2,888	3,399	714,862	1.18	248	5.1	4.6
	All Workings	EQ-ERA	3,813	6,771	2,107,771	1.78	553	5.4	5.0
Idaho and Washington	First	EQ-ERA	2,576	8,083	2,807,860	3.14	1,090	4.4	6.3
	Second	EQ-ERA	2,888	3,399	714,862	1.18	248	5.1	4.6
	All Workings	EQ-ERA	5,464	11,482	3,522,722	2.10	645	4.8	5.4

TABLE NO. 5

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1938
MOUNT SPOKANE OPERATION

State	Working	Number of Acres Worked by Bureau of Entomology and Plant Quarantine — Federal: Forest Service	Federal: Public Domain	Federal: Total	State	Private	Total
Idaho	First	80		80	359	1,212	1,651
Washington	First		36	36	80	809	925
	Second		60	60	352	2,476	2,888
	Total		96	96	432	3,285	3,813
Total	First	80	36	116	439	2,021	2,576
	Second		60	60	352	2,476	2,888
	Total	80	96	176	791	4,497	5,464

TABLE NO. 6

RESULTS OF CHECKING ON AREAS WORKED, 1938
MOUNT SPOKANE OPERATION

Eradication Type	Average Results for All Areas — Acres in Checked Area	Acres Checked	Ribes Per Acre: Bushes	Ribes Per Acre: Live Stem
Open Reproduction	2,475	95.28	5.7	6.7
Dense Reproduction	120	4.88	3.1	2.5
Open Pole	1,206	54.15	3.4	4.8
Dense Pole	74	2.96	1.0	1.7
Open Mature	309	11.58	15.6	7.8
Dense Mature	32	1.14		
Brush	511	18.87	1.0	1.6
Subalpine	6	.22		
All Upland	4,733	189.08	5.0	5.5
Stream (Hand)	115	13.48	1.9	4.7
All Types	4,848	202.56	4.8	5.4

TABLE NO. 7

TOTAL RIBES BY SPECIES ERADICATED, 1938
MOUNT SPOKANE OPERATION

Working	Eradication Type	Acres	Ribes by Species: Ribes lacustre	Ribes viscosissimum	Ribes inerme	Total Ribes
First	Open Reproduction	1,706	445,334	1,684,563	9,685	2,139,582
	Dense Reproduction	53	8,937	2,598		11,535
	Open Pole	202	93,519	182,757		276,276
	Open Mature	58	26,773	35,086		61,859
	Brush	449	21,522	14,984		36,506
	All Upland	2,468	596,085	1,919,988	9,685	2,525,758
	Stream	108	149,157	38,353	94,592	282,102
	All Types	2,576	745,242	1,958,341	104,277	2,807,860
Second	Open Reproduction	1,158	56,962	211,953		268,915
	Dense Reproduction	69	675	253		928
	Open Pole	1,089	109,846	147,489		257,335
	Dense Pole	74	4,270	505		4,775
	Open Mature	257	29,077	62,589		91,666
	Dense Mature	32	224	279		503
	Brush	65	25,594	19,653		45,247
	Subalpine	4	12	84		96
	All Upland	2,748	226,660	442,805		669,465
	Stream	140	42,948	2,449		45,397
	All Types	2,888	269,608	445,254		714,862
All Workings	Open Reproduction	2,864	502,296	1,896,516	9,685	2,408,497
	Dense Reproduction	122	9,612	2,851		12,463
	Open Pole	1,291	203,365	330,246		533,611
	Dense Pole	74	4,270	505		4,775
	Open Mature	315	55,850	97,675		153,525
	Dense Mature	32	224	279		503
	Brush	514	47,116	34,637		81,753
	Subalpine	4	12	84		96
	All Upland	5,216	822,745	2,362,793	9,685	3,195,223
	Stream	248	192,105	40,802	94,592	327,499
	All Types	5,464	1,014,850	2,403,595	104,277	3,522,722

SUMMARY OF RIBES ERADICATION, 1935-1938
MOUNT SPOKANE OPERATION

TABLE NO. 8 - SUMMARY OF ALL WORKINGS

Eradication Type	Acres First Working	Acres Second Working	Acres Third Working	Total Acres	Effective Man Days	Total Ribes
Open Reproduction	5,885	2,785	113	8,783	19,682	5,359,958
Dense Reproduction	335	200		535	757	172,922
Open Pole	7,725	3,048	53	10,826	11,370	2,825,972
Dense Pole	623	159		782	402	69,887
Open Mature	1,076	464	9	1,549	3,300	677,506
Dense Mature	735	102		837	185	34,017
Cut Over	526	146	48	720	996	320,860
Brush	1,924	601	15	2,540	2,887	377,676
Subalpine	515	172		687	458	94,095
All Upland	19,344	7,677	238	27,259	40,037	9,932,893
Stream (Hand)	402	214		616	2,487	843,230
All Types	19,746	7,891	238	27,875	42,524	10,776,123

TABLE NO. 8A - FIRST WORKING

Eradication Type	Acres	Effective Man Days	Total Ribes	Per Acre Basis Man Days	Per Acre Basis Ribes
Open Reproduction	5,885	16,465	4,722,717	2.80	803
Dense Reproduction	335	497	147,657	1.48	441
Open Pole	7,725	8,839	2,397,007	1.14	310
Dense Pole	623	317	58,388	.51	94
Open Mature	1,076	2,667	542,489	2.48	504
Dense Mature	735	165	33,155	.22	45
Cut Over	526	710	236,846	1.35	450
Brush	1,924	1,923	289,058	1.00	150
Subalpine	515	334	85,746	.65	166
All Upland	19,344	31,917	8,513,063	1.65	440
Stream (Hand)	402	2,131	785,414	5.30	1,954
All Types	19,746	34,048	9,298,477	1.72	471

TABLE NO. 8B - SECOND WORKING

Eradication Type	Acres	Effective Man Days	Total Ribes	Per Acre Basis Man Days	Per Acre Basis Ribes
Open Reproduction	2,785	3,121	617,164	1.12	222
Dense Reproduction	200	260	25,265	1.30	126
Open Pole	3,048	2,512	427,940	.82	140
Dense Pole	159	85	11,499	.53	72
Open Mature	464	626	134,863	1.35	291
Dense Mature	102	20	862	.20	9
Cut Over	146	243	71,561	1.66	490
Brush	601	947	88,180	1.58	147
Subalpine	172	124	8,349	.72	49
All Upland	7,677	7,938	1,385,683	1.03	180
Stream (Hand)	214	356	57,816	1.66	270
All Types	7,891	8,294	1,443,499	1.05	183

TABLE NO. 8C - THIRD WORKING

Eradication Type	Acres	Effective Man Days	Total Ribes	Per Acre Basis Man Days	Per Acre Basis Ribes
Open Reproduction	113	96	20,077	.85	178
Open Pole	53	19	1,025	.36	19
Open Mature	9	7	154	.78	17
Cut Over	48	43	12,453	.90	259
Brush	15	17	438	1.13	29
All Types	238	182	34,147	.76	143

TABLE NO. 9

SUMMARY OF RIBES ERADICATION BY CLASSES OF CAMPS, 1935-1938
MOUNT SPOKANE OPERATION

State	Working	Class	Acres	Effective Man Days	Total Ribes	Per Acre Basis Man Days	Per Acre Basis Ribes
Idaho	First	EQ-ERA	1,651	4,711	1,414,951	2.85	857
Washington	First	EQ-ERA	18,095	29,337	7,883,526	1.62	436
	Second	EQ-ERA	7,891	8,294	1,443,499	1.05	183
	Third	EQ-ERA	238	182	34,147	.76	143
	All Workings	EQ-ERA	26,224	37,813	9,361,172	1.44	357
Idaho and Washington	First	EQ-ERA	19,746	34,048	9,298,477	1.72	471
	Second	EQ-ERA	7,891	8,294	1,443,499	1.05	183
	Third	EQ-ERA	238	182	34,147	.76	143
	All Workings	EQ-ERA	27,875	42,524	10,776,123	1.53	387

TABLE NO. 10

OWNERSHIP OF LAND COVERED ON RIBES ERADICATION, 1935-1938
MOUNT SPOKANE OPERATION

State	Working	Number of Acres Worked by Ownership Classes: Federal: Forest Service	Federal: Public Domain	Federal: Total	State	Private	Total
Idaho	First	80		80	359	1,212	1,651
Washington	First		315	315	4,752	13,028	18,095
	Second		60	60	2,664	5,167	7,891
	Third				153	85	238
	All Workings		375	375	7,569	18,280	26,224
Total	First	80	315	395	5,111	14,240	19,746
	Second		60	60	2,664	5,167	7,891
	Third				153	85	238
	All Workings	80	375	455	7,928	19,492	27,875

TABLE NO. 11

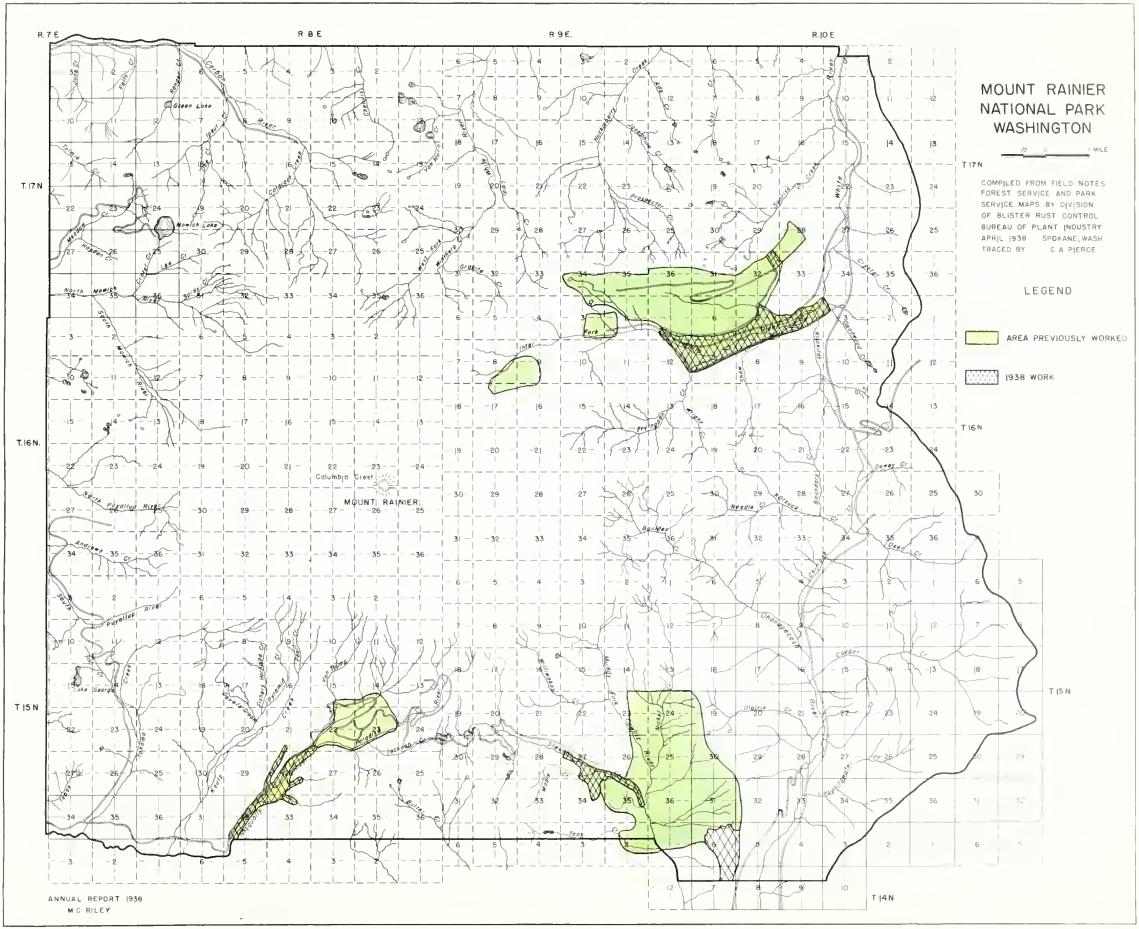
PROGRESS OF FIRST WORKING BY OWNERSHIP CLASSES, 1935-1938
MOUNT SPOKANE OPERATION

State	Ownership Class	Number of Acres		
		Worked	Unworked	Total
Idaho	Forest Service	80	310	390
	Public Domain		585	585
	Sub-total Federal	80	895	975
	State	359	1,366	1,725
	Private	1,212	11,358	12,570
	Total	1,651	13,619	15,270
Washington	Public Domain	315		315
	State	4,752	1,953	6,705
	Private	13,028	557	13,585
	Total	18,095	2,510	20,605
Total	Forest Service	80	310	390
	Public Domain	315	585	900
	Sub-total Federal	395	895	1,290
	State	5,111	3,319	8,430
	Private	14,240	11,915	26,155
	Total	19,746	16,129	35,875

TABLE NO. 12

TOTAL RIBES BY SPECIES ERADICATED, 1935-1938
MOUNT SPOKANE OPERATION

Working	Eradication Type	Acres	Ribes by Species			Total Ribes
			Ribes lacustre	Ribes viscosissimum	Ribes inerme	
First	Open Reproduction	5,885	1,269,800	3,443,232	9,685	4,722,717
	Dense Reproduction	335	129,743	17,914		147,657
	Open Pole	7,725	1,153,989	1,243,018		2,397,007
	Dense Pole	623	34,394	23,994		58,388
	Open Mature	1,076	259,455	283,034		542,489
	Dense Mature	735	11,281	21,874		33,155
	Cut Over	526	136,659	100,187		236,846
	Brush	1,924	85,890	203,168		289,058
	Subalpine	515	46,423	39,323		85,746
	All Upland	19,344	3,127,634	5,375,744	9,685	8,513,063
	Stream	402	623,611	67,211	94,592	785,414
	All Types	19,746	3,751,245	5,442,955	104,277	9,298,477
Second	Open Reproduction	2,785	150,627	466,537		617,164
	Dense Reproduction	200	16,421	8,844		25,265
	Open Pole	3,048	177,269	250,671		427,940
	Dense Pole	159	5,771	5,728		11,499
	Open Mature	464	38,680	96,183		134,863
	Dense Mature	102	463	399		862
	Cut Over	146	44,285	27,276		71,561
	Brush	601	40,465	47,715		88,180
	Subalpine	172	4,370	3,979		8,349
	All Upland	7,677	478,351	907,332		1,385,683
	Stream	214	54,562	3,254		57,816
	All Types	7,891	532,913	910,586		1,443,499
Third	Open Reproduction	113	9,561	10,516		20,077
	Open Pole	53	626	399		1,025
	Open Mature	9	54	100		154
	Cut Over	48	8,578	3,875		12,453
	Brush	15	140	298		438
	All Types	238	18,959	15,188		34,147
All Workings	Open Reproduction	8,783	1,429,988	3,920,285	9,685	5,359,958
	Dense Reproduction	535	146,164	26,758		172,922
	Open Pole	10,826	1,331,884	1,494,088		2,825,972
	Dense Pole	782	40,165	29,722		69,887
	Open Mature	1,549	298,189	379,317		677,506
	Dense Mature	837	11,744	22,273		34,017
	Cut Over	720	189,522	131,338		320,860
	Brush	2,540	126,495	251,181		377,676
	Subalpine	687	50,793	43,302		94,095
	All Upland	27,259	3,624,944	6,298,264	9,685	9,932,893
	Stream	616	678,173	70,465	94,592	843,230
	All Types	27,875	4,303,117	6,368,729	104,277	10,776,123


MOUNT RAINIER
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SERVICE MAPS BY DIVISION
OF BLISTER RUST CONTROL
BUREAU OF PLANT INDUSTRY
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ANNUAL REPORT 1938
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TABLE NO. 1

SUMMARY OF RIBES ERADICATION, 1938
MOUNT RAINIER NATIONAL PARK

Working	Area	Eradication Type	Acres	Effective Man Days	Ribes by Species: Ribes lacustre	Ribes viscosissimum	Ribes bracteosum	Ribes watsonianum	Ribes laxiflorum	Ribes acerifolium	Ribes sanguineum	Total Ribes	Per Acre Basis: Man Days	Per Acre Basis: Ribes
First	Stevens Canyon	Open Pole	534	38	176		1,052				16	1,244	.07	2
		Stream	11	170	279		4,321					4,600	15.45	418
		All Types	545	208	455		5,373				16	5,844	.38	11
Second	Stevens Canyon	Stream	78	320	218		14,818					15,036	4.10	193
	White River	Open Pole	95	48		166		334		3		503	.51	5
		Stream	10	31	1,240		27					1,267	3.10	127
		All Types	105	79	1,240	166	27	334		3		1,770	.75	17
	All Areas	Open Pole	95	48		166		334		3		503	.51	5
		Stream	88	351	1,458		14,845					16,303	3.99	185
		All Types	183	399	1,458	166	14,845	334		3		16,806	2.18	92
Third	Longmire	Stream	393	226	9,451		1,173		316		6	10,946	.58	28
	Stevens Canyon	Stream	37	108			1,733					1,733	2.92	47
	White River	Stream	423	153	6,801	2,176	34		52			9,063	.36	21
	All Areas	Stream	853	487	16,252	2,176	2,940		368		6	21,742	.57	25
All Workings	Longmire	Stream	393	226	9,451		1,173		316		6	10,946	.58	28
	Stevens Canyon	Open Pole	534	38	176		1,052				16	1,244	.07	2
		Stream	126	598	497		20,872					21,369	4.75	170
		All Types	660	636	673		21,924				16	22,613	.96	34
	White River	Open Pole	95	48		166		334		3		503	.51	5
		Stream	433	184	8,041	2,176	61		52			10,330	.42	24
		All Types	528	232	8,041	2,342	61	334	52	3		10,833	.44	21
	All Areas	Open Pole	629	86	176	166	1,052	334		3	16	1,747	.14	3
		Stream	952	1,008	17,989	2,176	22,106		368		6	42,645	1.06	45
		All Types	1,581	1,094	18,165	2,342	23,158	334	368	3	22	44,392	.69	28

TABLE NO. 2

SUMMARY OF RIBES ERADICATION, 1930-1938
MOUNT RAINIER NATIONAL PARK

Working	Area	Eradication Type	Acres	Effective Man Days	Ribes by Species								Total Ribes	Per Acre Basis	
					Ribes lacustre	Ribes viscosissimum	Ribes bracteosum	Ribes watsonianum	Ribes laxiflorum	Ribes acerifolium	Ribes sanguineum	Ribes triste		Man Days	Ribes
First	Longmire	Open Reproduction	274	397	40,281		1,101		5,409	5,804			52,595	1.45	192
		Stream	626	1,202	185,687		97,774		53,899	2,838	16		340,214	1.92	543
		All Types	900	1,599	225,968		98,875		59,308	8,642	16		392,809	1.78	436
	Stevens Canyon	Open Reproduction	2,351	218	28,071		15,986				7,915		51,972	.09	22
		Open Pole	704	38	176		1,052				16		1,244	.05	2
		All Upland	3,055	256	28,247		17,038				7,931		53,216	.08	17
		Stream	1,185	4,727	69,523	2,055	440,165		914	11	3,940		516,608	3.99	436
		All Types	4,240	4,983	97,770	2,055	457,203		914	11	11,871		569,824	1.18	134
	White River	Open Reproduction	66	50	6,869	239	21	1,133	550	194			9,006	.76	136
		Open Pole	1,870	2,087	173,780	69,529	539	139,238	1,189	10,801	91	744	395,911	1.12	212
		Open Mature	322	264	27,327	12,847			5	45			40,224	.82	125
		All Upland	2,258	2,401	207,976	82,615	560	140,371	1,744	11,040	91	744	445,141	1.06	197
		Stream	423	744	162,856	1,510	4,869	242	8,820	188	98	8	178,591	1.76	422
		All Types	2,681	3,145	370,832	84,125	5,429	140,613	10,564	11,228	189	752	623,732	1.17	233
	Starbo	Open Reproduction	48	21	68	7		7		2,305			2,387	.44	50
		Open Pole	332	262	11,276	6,131		6,723	3,221	16,658			44,009	.79	133
		All Upland	380	283	11,344	6,138		6,730	3,221	18,963			46,396	.74	122
		Stream	46	46	2,663	575		476	546	409			4,669	1.00	102
		All Types	426	329	14,007	6,713		7,206	3,767	19,372			51,065	.77	120
	All Areas	Open Reproduction	2,739	686	75,289	246	17,108	1,140	5,959	8,303	7,915		115,960	.25	42
		Open Pole	2,906	2,387	185,232	75,660	1,591	145,961	4,410	27,459	107	744	441,164	.82	152
		Open Mature	322	264	27,327	12,847			5	45			40,224	.82	125
		All Upland	5,967	3,337	287,846	88,753	18,699	147,101	10,374	35,807	8,022	744	597,348	.56	100
		Stream	2,280	6,719	420,729	4,140	542,808	718	64,179	3,446	4,054	8	1,040,082	2.95	456
		All Types	8,247	10,056	708,577	92,893	561,507	147,819	74,553	39,253	12,076	752	1,637,430	1.22	199
Second	Longmire	Open Reproduction	203	97	9,744		1,101						10,845	.48	53
		Stream	453	343	6,431		20,859		387	1,366			29,043	.76	64
		All Types	656	440	16,175		21,960		387	1,366			39,888	.67	61
	Stevens Canyon	Stream	392	1,004	38,558		79,555						118,113	2.56	301
	White River	Open Reproduction	66	12	221			77					298	.18	5
		Open Pole	1,772	1,268	36,268	8,391	2,176	4,003	16,095	14			66,947	.72	38
		Open Mature	322	47	1,278	2,011							3,289	.15	10
		All Upland	2,160	1,327	37,767	10,402	2,176	4,080	16,095	14			70,534	.61	33
		Stream	394	657	32,748		154		5				32,907	1.67	84
		All Types	2,554	1,984	70,515	10,402	2,330	4,080	16,100	14			103,441	.78	41
	All Areas	Open Reproduction	269	109	9,965		1,101	77					11,143	.41	41
		Open Pole	1,772	1,268	36,268	8,391	2,176	4,003	16,095	14			66,947	.72	38
		Open Mature	322	47	1,278	2,011							3,289	.15	10
		All Upland	2,363	1,424	47,511	10,402	3,277	4,080	16,095	14			81,379	.60	34
		Stream	1,239	2,004	77,737		100,568		392	1,366			180,063	1.62	145
		All Types	3,602	3,428	125,248	10,402	103,845	4,080	16,487	1,380			261,442	.95	73
Third	Longmire	Stream	393	226	9,451		1,173		316		6		10,946	.58	28
	Stevens Canyon	Stream	37	108			1,733						1,733	2.92	47
	White River	Stream	423	153	6,801	2,176	34		52				9,063	.36	21
	All Areas	Stream	853	487	16,252	2,176	2,940		368		6		21,742	.57	25
All Workings	Longmire	Open Reproduction	477	494	50,025		2,202		5,409	5,804			63,440	1.04	133
		Stream	1,472	1,771	201,569		119,806		54,602	4,204	22		380,203	1.20	258
		All Types	1,949	2,265	251,594		122,008		60,011	10,008	22		443,643	1.16	228
	Stevens Canyon	Open Reproduction	2,351	218	28,071		15,986				7,915		51,972	.09	22
		Open Pole	704	38	176		1,052				16		1,244	.05	2
		All Upland	3,055	256	28,247		17,038				7,931		53,216	.08	17
		Stream	1,614	5,839	108,081	2,055	521,453		914	11	3,940		636,454	3.62	394
		All Types	4,669	6,095	136,328	2,055	538,491		914	11	11,871		689,670	1.31	148
	White River	Open Reproduction	132	62	7,090	239	21	1,210	550	194			9,304	.47	70
		Open Pole	3,642	3,355	210,048	77,920	2,715	143,241	17,284	10,815	91	744	462,858	.92	127
		Open Mature	644	311	28,605	14,858			5	45			43,513	.48	68
		All Upland	4,418	3,728	245,743	93,017	2,736	144,451	17,839	11,054	91	744	515,675	.84	117
		Stream	1,240	1,554	202,405	3,686	5,057	242	8,877	188	98	8	220,561	1.25	178
		All Types	5,658	5,282	448,148	96,703	7,793	144,693	26,716	11,242	189	752	736,236	.93	130
	Starbo	Open Reproduction	48	21	68	7		7		2,305			2,387	.44	50
		Open Pole	332	262	11,276	6,131		6,723	3,221	16,658			44,009	.79	133
		All Upland	380	283	11,344	6,138		6,730	3,221	18,963			46,396	.74	122
		Stream	46	46	2,663	575		476	546	409			4,669	1.00	102
		All Types	426	329	14,007	6,713		7,206	3,767	19,372			51,065	.77	120
	All Areas	Open Reproduction	3,008	795	85,254	246	18,209	1,217	5,959	8,303	7,915		127,103	.26	42
		Open Pole	4,678	3,655	221,500	84,051	3,767	149,964	20,505	27,473	107	744	508,111	.78	109
		Open Mature	644	311	28,605	14,858			5	45			43,513	.48	68
		All Upland	8,330	4,761	335,359	99,155	21,976	151,181	26,469	35,821	8,022	744	678,727	.57	81
		Stream	4,372	9,210	514,718	6,316	646,316	718	64,939	4,812	4,060	8	1,241,887	2.11	284
		All Types	12,702	13,971	850,077	105,471	668,292	151,899	91,408	40,633	12,082	752	1,920,614	1.10	151

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[illegible] National Park [illegible] Bureau of Entomology and Plant Quarantine.

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Area	Acres	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
All Areas	[illegible]	[illegible]	[illegible]	[illegible]

*[illegible]

Introduction

Disease study work was continued in 1928 [illegible] in the 1927 annual report. Scouting for the rust and [illegible] survey are treated in this report which [illegible] [illegible] of special [illegible] [illegible] and the effect of small numbers of ribes in [illegible] of years.

A. Scouting for the Rust

Blister rust on ribes was found at [illegible] locations [illegible] buted over blister [illegible] work on both sides of the [illegible] represents an [illegible] extension of the known limits of the [illegible] part of the region.

B. Pine Disease Survey

The pine disease survey was continued on the same [illegible] the same purposes as outlined in the 1927 annual report [illegible] [illegible] of cankers was noted in the [illegible]. In determining the [illegible] percent infected some difficulty was encountered [illegible] only the year of growth in which each canker occurred. [illegible] stage reached by each canker on each year of growth [illegible] much more satisfactory and accurate information, especially [illegible] of two or three years between waves of infection. [illegible] determining the percentage of infection for each year [illegible] is some [illegible] each year. [illegible], the difficulty [illegible] determining the percentage of infection for the [illegible] work was [illegible]. The [illegible] used is [illegible] enough to give a satisfactory comparison between the [illegible] and after the ribes eradication work.

In order further to obviate this difficulty [illegible] together for two or more years when this facilitates the work [illegible] the result on control effectiveness. As 1926 is the [illegible] complete infection data are available [illegible] of control [illegible] conducted only on areas worked in 1927 and 1928 [illegible] scale control work in [illegible] was initiated. [illegible] [illegible] a poor year for [illegible], and 1924 infection [illegible] or near some of the [illegible] centers of infection. [illegible] aggregate this infection. Both 1925 and 1926 [illegible] were [illegible] various parts of the Inland Empire and in many cases [illegible]

[illegible] basis of the number of infection spots recorded for [illegible] 1928 to 1931 [illegible] 1932 and 1933 [illegible] was completed in 1932 and where the segregation of 1933 and [illegible] relatively easy. [illegible] and 1936 infections are compiled together.

Another difference between the 1935 and 1936 work [illegible] intensive work was [illegible]. On the St. Joe, Clearwater, and [illegible] Cabinet operations which are in the Ribes petiolare belt the [illegible] be found in the stream type if it exists in the upland. This does not hold true on the Coeur d'Alene and Kaniksu operations where the [illegible] cannot be attached to the stream type. Here in spite of the fact that stream conditions are favorable to rust development larger amounts [illegible] existing in the upland at some distance from streams [illegible] than exists in or near the stream type. In some cases [illegible] in the upland [illegible] attached near the stream. In order to [illegible] locating the rust where it exists in any quantity the workers [illegible] five and strips were run through each section at [illegible] scout work was conducted on some of the [illegible] in the Coeur d'Alene [illegible] no stream scout work was performed on the Kaniksu operation. [illegible] work will be continued on a [illegible] basis in 1939.

RESULTS

The work in 1936 was accomplished with a crew of eight [illegible] employed on emergency funds from May [illegible] to November 10 and a crew of [illegible] school students employed on regular Forest Service funds from [illegible] 15; three of these men continued work until November.

The volume of work accomplished on the Inland Empire [illegible] operations in table 1. This is followed by tables 2, 3, and 4 [illegible] data for each operation tabulated by drainage and years when [illegible] work was performed. In some cases several streams are combined in order to give a comparison of results on a [illegible] basis for each [illegible] working. These results may be averaged over the [illegible] in planning priority of rework and this information together [illegible] being made available by section. All disease and [illegible] data [illegible] on township plats with a scale of four inches to the mile. [illegible] together with a compilation for each [illegible] information to aid in planning priority of working.

TABLE NO. [illegible]

[illegible] SURVEY [illegible]

[illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

TABLE NO. 2

PINE DISEASE SURVEY, 1938
SUMMARY BY DRAINAGE AND YEARS OF WORKING, COEUR D'ALENE OPERATION

Drainage			White Pine			Cankers		Cumulative Percentages of Trees Infected and of Trees Reinfected by Years										
									1929-1931		1932-1933		1934		1935-1936		1937	
Years of Ribes Eradication	Strip Location	Miles of Strip	Number Examined	Number Infected	Per Cent	Number	Per 100 Trees	Up to 1928	New	Rein-fected	New	Rein-fected	New	Rein-fected	New	Rein-fected	New	Rein-fected
Coeur d'Alene River, Big Creek, Uranus Creek, T.50-51N R. 4E																		
1933	Upland	10.07	6,744	6	.09	6	.09	.06							.09			
1934	Upland	19.24	15,383	1,530	9.94	7,196	46.8	.08	.27		8.8	8.9	8.9	9.0	9.94	11.31		11.32
1935	Upland	23.03	12,342	398	3.22	1,564	12.7	.05	.06	.07	3.12	3.17	3.12	3.20	3.22	3.54		
1936	Upland	8.31	5,956	867	14.56	5,758	96.67	.03			13.46	13.49	13.58	13.63	14.56	16.08		
Unworked	Upland	.78	955	3	.31	3	.31				.31							
Total	Upland	61.44	41,380	2,804	6.77	14,527	35.1	.05	.12	.13	6.14	6.2	6.21	6.23	6.77	8.01		8.02
Falls Creek, T.51N R.4E																		
1935	Upland	3.9	418	1	.24	1	.24				.24							
Prichard and Eagle Creeks, T.50N R.4E																		
1933	Stream	6.87	1,227	89	7.25	307	25.02	.24	1.38		6.19	7.09			7.25			
	Upland	2.12	343	11	3.2	68	19.8				2.9				3.2	3.5		
1934	Stream	.56	68	1	.47	1	.47				.47							
	Upland	3.63	1,303	19	1.45	29	2.22				1.22				1.45	8.72		
Unworked	Stream	1.12	54	17	31.5	109	201.8				9.25				31.5	37.03		
Total	Stream	8.56	1,349	107	7.93	417	30.91	.22	1.26		6.07	6.9			7.93	9.5		
	Upland	5.75	1,646	30	1.82	97	5.9				1.57				1.82	1.88		
Brown and Grizzly Creeks, T.50N R.3E																		
1933	Stream	4.5	791	9	1.14	13	1.77				1.01				1.14	1.52		
	Upland	2.29	5,577	52	.93	88	1.58	.02			.77	.79			.93			
1934	Stream	2.25	596	11	1.84	14	2.34	.33			1.17				1.84			
	Upland	2.89	6,306	134	2.12	234	3.71	.02			1.38				2.12			
1935	Stream	4.27	1,199	66	5.5	152	12.68				4.42				5.5	6.17		
	Upland	10.97	1,311	12	.91	17	1.29				.68				.91	.99		
1936	Stream	.87	62	11	17.74	14	22.58				17.74							
	Upland	1.97	112	7	6.25	11	9.82				3.57				6.25			
Unworked	Stream	3.62	811	219	27.0	891	109.86		.12		14.42		15.28		27.0	32.68		
	Upland	6.18	2,318	307	13.24	1,514	65.31	.04	.09		4.78	4.83			13.24	16.09		
Total	Stream	15.53	3,459	316	9.13	1,084	31.33	.06	.09		5.66		5.86		9.13	10.72		
	Upland	24.3	15,524	512	3.29	1,864	12.00	.02	.02		1.63	1.64			3.29	3.73		
Steamboat Creek, T.50N R.2E																		
1934	Upland	12.6	6,295	522	8.29	1,743	27.68	.03	.16		6.89	6.92	7.45	7.54	8.29	9.48		
Unworked	Upland	6.67	3,506	745	21.24	8,627	246.06	.59	1.74	1.85	15.65	16.28	15.74	16.45	21.24	32.43		32.54
Total	Upland	19.27	9,801	1,267	12.92	10,370	105.8	.23	.72	.76	10.02	10.27	10.41	10.73	12.92	17.36		17.4
Cedar and Carpenter Creeks, T.49N R.3E																		
Unworked	Stream	5.02	607	29	4.77	55	9.06				.82				4.77	4.94		
	Upland	1.24	787	56	7.11	239	30.36				3.3				7.11	8.76		8.89
Hazendorf and McPhee Creeks, T.49N R.2E																		
Unworked	Stream	3.54	507	16	3.15	80	15.77	.19			.78				3.15	3.35		
	Upland	2.2	190	10	5.26	311	163.68				1.05				5.26	6.84		
North Fork Coeur d'Alene River, Deception Creek to Lewelling Creek, T.51-52N R.1W																		
1927-1928	Upland	15.25	1,178															
1927-1928, 1933	Upland	17.67	5,504	70	1.27	97	1.76		.11		.34		.87		1.27	1.28		
1927-1928, 1934	Upland	42.85	19,564	365	1.86	823	4.20	.01	.02		1.27		1.42		1.86	2.03		
1927-1928, 1935	Upland	6.01	1,145	2	.17	2	.17		.09		.17							
1934	Upland	11.62	3,548	9	.25	28	.79				.08				.25	.28		
1935	Upland	9.97	2,521	7	.27	7	.27				.24				.27			
Unworked	Upland	16.55	2,254	29	1.28	42	1.86				.22		.66		1.28			
Total	Upland	119.92	35,714	482	1.34	999	2.79	.01	.02		.79		.98		1.34	1.44		
North Fork of Coeur d'Alene River, Skookum Creek to Lindberg Creek, T.51N R.1W																		
1927-1928, 1933	Upland	3.52	1,502															
1927-1928, 1934	Upland	11.02	4,354	120	2.75	357	8.20	.06	.30		.59	.62	2.68	2.91	2.75	3.0		
1927-1928, 1935	Upland	2.15	290															
1933	Upland	.5	125															
1934	Upland	3.19	347	1	.29	1	.29								.29			
1936	Upland	2.83	1,841	6	.33	6	.33				.16				.33			
Unworked	Upland	5.91	4,980	73	1.46	266	5.34				.12		.18		1.46	1.52		
Total	Upland	29.13	13,439	200	1.48	630	4.68	.02	.09		.26	.27	.96	1.03	1.48	1.59		
Leiberg Creek, T.51N R.1E																		
1933	Upland	2.09	362															
1934	Upland	2.82	1,005															
Total	Upland	4.9	1,367															
North and Snow Creeks, T.53N R.1E																		
Unworked	Stream	4.8	778															
	Upland	29.8	13,963															
Grand Total		339.4	140,929	5,830	4.13	30,674	21.76	.04	.12	.12	3.15	3.19	3.31	3.38	4.13	4.97		4.98

TABLE NO. 3

PINE DISEASE SURVEY, 1938
SUMMARY BY DRAINAGE AND YEARS OF WORKING, CLEARWATER OPERATION

Drainage			White Pine			Cankers		Cumulative Percent of Trees Infected and of Trees Reinfected by Years										
									1929-1931		1932-1933		1934		1935-1936		1937	
Years of Ribes Eradication	Strip Location	Miles of Strip	Number Examined	Number Infected	Per Cent	Number	Per 100 Trees	Up to 1928	New	Reinfected	New	Reinfected	New	Reinfected	New	Reinfected	New	Reinfected
Lower Beaver Creek Area, T.39-40N R.6-7E																		
1933	Stream	3.7	382	15	3.93	15	3.93	.78			1.05				3.93			
	Upland	6.3	8,926	496	5.56	861	9.65	.01	.06		1.97	1.98			5.56	6.13		
1934	Stream	2.3	2															
	Upland	.9	611	16	2.62	16	2.62								2.62			
Unworked	Stream	4.2	99	3	3.03	4	4.04		1.10						3.03			
	Upland	2.4	2,331	319	13.69	1,251	53.67		.39		8.26	8.49			13.69	15.19		
Total	Stream	10.3	483	18	3.73	19	3.93	.62	.83		1.04				3.73			
	Upland	9.6	11,868	831	7.00	2,128	17.93	.01	.12		3.10	3.16			7.00	7.73		
Upper Beaver Creek, T.39-40N R.5-6E																		
1933	Stream	9.4	977	53	5.42	118	12.08		.41		2.46				5.42	5.63		
	Upland	3.5	582	12	2.06	39	6.70				1.20				2.06	2.75		
1934	Stream	.3	5															
	Upland	3.9	217															
Unworked	Stream	.7	6	1	16.67	2	33.33				16.67							
	Upland	4.1	259	5	1.93	23	8.88				1.54				1.93	2.70		
Total	Stream	10.4	988	54	5.46	120	12.14		.40		2.53				5.46	5.57		
	Upland	11.6	1,058	17	1.61	62	5.86				1.04				1.61	2.17		
Harlan Creek, T.40N R.5-6E																		
1933	Stream	4.6	165	14	8.48	150	90.91				4.24				8.48	11.51		
	Upland	10.5	3,525	452	12.82	993	28.17			.51	4.51		5.90		12.82	13.39		
1934	Upland	1.6	31	3	9.68	13	41.93				9.68							
Unworked	Stream	1.1	249	77	30.92	1,254	503.61				1.60				30.92	43.37		43.77
	Upland	1.5	360	39	10.83	120	33.33				3.33				10.83	13.89		
Total	Stream	5.7	414	91	21.98	1,404	339.13				2.66				21.98	30.68		30.92
	Upland	13.7	3,916	494	12.61	1,126	30.30			.46	4.44		5.69		12.61	13.40		
Dead Horse Creek, T.39N R.7E																		
1931	Stream	3.7	291	9	3.09	15	5.15				2.75				3.09			
	Upland	.5	449	3	.67	5	1.11				.67							
1934	Stream	3.0	336	22	6.55	47	13.99				4.76				6.55	7.14		
	Upland	16.7	5,006	58	1.16	67	1.34		.02		1.10		1.14		1.16			
Unworked	Upland	.1																
Total	Stream	6.6	627	31	4.94	62	9.88				3.83				4.94	5.26		
	Upland	17.3	5,455	61	1.12	72	1.32		.02		1.06		1.09		1.12			
Lodge and Tumble Creeks, T.38-39N R.7E																		
1932	Stream	1.3	151	6	3.97	8	5.30				1.32				3.97			
	Upland	6.6	2,025	2	.10	2	.10				.10							
1935	Upland	.7	79															
1936	Upland	6.9	2,309	211	9.14	417	18.06	.13	.30		3.94	4.03			9.14	10.48		
1937	Stream	4.2	435	67	15.40	362	83.21	.23			5.06				15.40	17.93		
	Upland	3.3	422	2	.47	2	.47				.23				.47			
Unworked	Stream	.7	11															
	Upland	2.8	521	4	.77	7	1.34				.77							
Total	Stream	6.8	597	73	12.23	370	61.98	.17			4.02				12.23			
	Upland	20.4	5,356	219	4.09	428	7.79	.06	.13		1.83	1.87			4.09	4.67		
Washington and Schofield Creeks, T.38-39N R.6-7E																		
1934	Stream	25.3	1,031	187	18.14	722	70.03	.10	.20		12.03		17.46	17.85	18.14	19.69		
	Upland	2.3	298	107	35.91	334	112.48				30.20				35.91	42.28		
1935	Stream	12.9	753	70	9.30	182	24.17		.26		7.97	8.10			9.30	10.36		
	Upland	4.4	945	12	1.27	27	2.86				1.27					1.38		
1936	Stream	4.1	226	30	13.27	101	44.70				7.96		10.18	10.62	13.27	15.04		
	Upland	4.1	631	10	1.58	27	4.28				1.58					1.74		
1937	Stream	3.5	172	6	3.49	10	5.81				3.49							
	Upland	.3	83	9	10.84	18	21.69				10.84							
Unworked	Stream	.3	1															
	Upland	.7	22															
Total	Stream	46.3	2,183	293	13.42	1,015	46.50	.14	.18		9.52	9.57	12.32	12.50	13.42	14.70		
	Upland	11.8	1,979	138	6.97	406	20.52				6.11				6.97	8.03		
Orogrande, Breakfast and Lower Crystal, Silver and Elk Creeks, T.37-38N R.6-7E																		
1933	Stream	10.9	3,974	134	3.37	224	5.64	.02	.04		1.96		2.47		3.37	3.55		
	Upland	3.4	975	17	1.74	44	4.51		.20		1.54			1.64	1.74	2.15		
1934	Stream	5.8	801	56	6.99	127	15.85				4.37		4.12		6.99	7.62		
	Upland	11.1	2,078	80	3.85	132	6.35		.05		2.60		2.89		3.85	4.23		
1935	Upland	6.1	1,031	52	5.04	100	9.70				4.36	4.46			5.04	5.52		
1936	Upland	7.6	576	9	1.56	10	1.74				1.39				1.56			
Unworked	Stream	12.2	2,595	47	1.81	60	2.31		.15		1.08				1.81	1.85		
	Upland	9.5	1,243	31	2.49	39	3.14		.08		.80		1.53		2.49			
Total	Stream	29.0	7,370	237	3.21	411	5.57	.01	.08		1.91		2.26		3.21	3.39		
	Upland	37.7	5,903	189	3.20	325	5.50		.07		2.24	2.25	2.49	2.52	3.20	3.51		
French Creek, T.37N R.6-7E																		
1932	Stream	11.3	1,302	40	3.07	54	4.15	.15	.61		2.46	2.61	2.53		3.07			
	Upland	2.4	52	2	3.85	4	7.70				3.85							
1933	Stream	2.5	383	58	15.14	327	85.38	1.58	2.09		13.58	14.88		15.14	15.14	17.75		
	Upland	.5	37	11	29.73	17	45.94				29.73							
1934	Stream	2.4	177	37	20.90	186	105.08	.56	1.13		19.21	20.34			20.90	24.29		
	Upland	22.1	1,474	73	4.95	214	14.52	.27	.61	.68	4.48	4.75	4.88		4.95			
1936	Stream	.4	38	1	2.63	3	7.89				2.63							
	Upland	2.3	929	51	5.49	134	14.42		2.69						5.49	6.46		
1937	Stream	.6	7	1	14.28	1	14.28				14.28							
	Upland	.4	7	1	14.28	1	14.28				14.28							
Unworked	Stream	5.4	646	41	6.35	65	10.06	.46			4.64	4.95			6.35	6.81		
	Upland	2.3	349	11	3.15	17	4.87				2.58				3.15	3.72		
Total	Stream	22.7	2,553	178	6.97	636	24.91	.47	.82		5.88	6.31	5.91	6.38	6.97	7.79		
	Upland	30.0	2,848	149	5.23	387	13.59	.14	.32	.35	4.00	4.14	4.21		5.23	5.90		

TABLE NO. 3A

PINE DISEASE SURVEY, 1938
SUMMARY BY DRAINAGE AND YEARS OF WORKING, CLEARWATER OPERATION

Drainage			White Pine			Cankers		Cumulative Percent of Treee Infected and of Trees Reinfected by Years										
									1929-1931		1932-1933		1934		1935-1936		1937	
Years of Ribes Eradication	Strip Location	Miles of Strip	Number Examined	Number Infected	Per Cent	Number	Per 100 Treee	Up to 1928	New	Rein-fected	New	Rein-fected	New	Rein-fected	New	Rein-fected	New	Rein-fected
Oxford R.S. Area, Upper Crystal, Silver, Elk and Shake Creeks, T.37-38N R.6-7E																		
1933	Stream	18.3	5,596	379	6.77	1,233	22.03	.39	1.45	1.57	5.57	5.59	5.63		6.77	7.90		
	Upland	21.0	4,039	332	8.22	1,193	29.54	.42	2.65	2.85	6.24	6.63	6.56		8.22	8.89		
1934	Stream	2.7	188	24	12.77	79	42.02	.53	1.60		7.45	8.51			12.77	14.36		
1936	Stream	1.8	179	39	21.79	140	78.21				21.23				21.79	22.91		
	Upland	.2																
Total	Stream	22.8	5,963	442	7.41	1,452	24.35	.39	1.41	1.53	6.10	6.49	6.15		7.41	8.55		
	Upland	21.2	4,039	332	8.22	1,193	29.54	.42	2.65	2.85	6.24	6.63	6.56		8.22	8.89		
Tamarack, Fir, Larch and Pine Creeks, T.37-38N R.7-8E																		
1932-1935	Upland	.8	431	3	.70	3	.70		.70									
1933-1935	Upland	1.4	158	11	6.96	37	23.42		.63		6.33				6.96	8.86		
	Stream	2.6	175	8	4.57	10	5.71				4.57							
1932	Upland	.3	12															
1933	Stream	1.1	81															
	Upland	.2	4															
1934	Stream	3.8	432	47	10.88	144	33.33				9.95				10.88	12.73		
	Upland	9.8	369	28	7.59	44	11.92				6.77				7.59			
1935	Stream	1.6	181	6	3.31	6	3.31				3.31							
	Upland	3.2	863	54	6.26	72	8.34				6.02				6.26	6.60		
1936	Stream	1.0	22	1	4.54	1	4.54				4.54							
	Upland	1.3	51	10	19.61	28	54.90				11.76				19.61	24.49		
Total	Stream	10.2	891	62	6.96	161	18.07				6.51				6.96	7.86		
	Upland	16.9	1,888	106	5.61	184	9.74		.21		5.08				5.61	6.09		
Musselshell and Gold Creeks, T.35-36N R.5-6E																		
1931	Stream	1.4	549	29	5.28	93	16.93				4.00				5.28	6.56		
1932	Stream	.8	416	6	1.44	8	1.92				1.20				1.44			
1933	Stream	7.2	659	36	5.46	65	9.86								5.46			
1934	Stream	3.1	1,111	35	3.15	43	3.87		.27		2.16				3.15			
1935	Stream	4.5	456	22	4.82	30	6.58		.22		3.73				4.82	5.04		
1937	Stream	7.2	1,490	5	.33	8	.54				.13				.33			
1933-1937	Stream	1.4	6	1	16.67	1	16.67								16.67			
Total	Stream	25.7	4,687	134	2.86	248	5.29		.08		1.96				2.86	3.03		
Jim Brown Creek, T.35-36N R.5E																		
1933	Stream	20.7	2,148	122	5.68	357	16.62	.05	.19		2.37	2.42	4.93		5.68	6.05		
1934	Stream	3.0	108	10	9.26	43	39.81				3.70				9.26	10.18		
Total	Stream	23.7	2,256	132	5.85	400	17.73	.04	.18		2.44	2.48	4.88		5.85	6.25		
Orofino and Rosebud Creeks, T.36N R.5-6E																		
1933	Stream	3.2	1,486	70	4.71	221	14.87		.07		2.62				4.71	4.84		
1934	Stream	9.2	1,930	193	10.00	481	24.92		.31		4.66	4.71	7.41	7.87	10.00	10.52		
1933-1937	Stream	.9	277	23	8.30	76	27.44				5.05		6.50	6.86	8.30	10.47		
Total	Stream	13.4	3,693	286	7.74	778	21.07		.19		3.87	3.90	5.41	5.67	7.74	8.18		
Grasshopper and Heywood Creeks, T.36N R.5E																		
1935	Stream	1.1	17															
1936	Stream	2.4	958	118	12.32	287	29.60	.63			7.93	8.04			12.32	14.61		
Total	Stream	3.6	975	118	12.10	287	29.43	.61			7.79	7.90			12.10	14.36		
Canal Gulch, Rhodes and Shanghai Creeks, T.36-37N R.5-6E																		
1933	Stream	3.4	1,426	129	9.05	688	48.25				3.51		3.58		9.05	10.73		10.79
	Upland	.9	232	25	10.78	56	24.14				6.03				10.78	13.36		
1934	Stream	16.1	7,213	786	10.90	3,336	46.25	.05	.17	.18	7.04	7.17	7.19	7.33	10.09	11.89		
	Upland	13.3	3,383	251	7.42	578	17.09	.03	.21		4.29	4.37	5.50	5.62	7.42	8.16		8.19
1935	Upland	2.1	294	8	2.72	16	5.44				2.38		2.72					
1933 and 1936	Stream	2.2	564	120	21.28	284	50.35				9.92				21.28	24.11		24.30
	Upland	.3	80															
Total	Stream	21.8	9,203	1,035	11.25	4,308	46.81	.04	.13	.14	6.68	6.77	6.80	6.91	11.25	13.55		13.57
	Upland	16.6	3,989	284	7.12	650	16.29	.03	.18		4.16	4.24	5.21	5.31	7.12	7.90		7.92
Snake Creek, T.37-38N R.4-5-6E																		
1933	Upland	5.7	742	74	9.97	177	23.85	.13	1.21		9.30	9.97	9.97			11.59		
1934	Stream	8.7	1,657	358	21.60	1,058	63.85		.06		14.54		17.38		21.60	25.35		
	Upland	15.0	1,431	521	36.41	1,915	133.82	.14	5.31	5.38	26.14	28.58	29.56	33.40	36.41	51.30		
1935	Upland	3.0	533	167	30.20	558	100.90	.18	.54		26.76	26.94	27.67		30.20	33.63		
1936	Stream	4.4	2,562	364	14.21	1,989	77.63		.04		6.95		9.76	9.87	14.21	18.27		
	Upland	3.6	671	38	5.66	71	10.58				4.77				5.66	5.96		
1937	Upland	.2	38	1	2.63	1	2.63				2.63							
Total	Stream	16.8	4,219	722	17.11	3,047	72.22		.05		9.93		12.75	12.82	17.11	21.05		
	Upland	27.6	3,415	801	23.46	2,722	79.71	.12	2.58	2.61	18.27	19.47	19.85	21.64	23.46	33.35		
Poorman Creek, T.37N R.4-5E																		
1934	Stream	4.5	1,295	122	9.42	689	53.42	.23	.77		8.72	9.34			9.42	12.66		
	Upland	4.2	1,998	52	2.60	122	6.11		.15		2.25	2.35			2.60	3.10		
1936	Stream	.4	126	1	.79	1	.79								.79			
Total	Stream	4.9	1,421	123	8.65	690	48.56	.21	.70		7.95	8.51			8.65	11.54		
	Upland	4.2	1,998	52	2.60	122	6.11	.15			2.25	2.35			2.60	3.10		
Whiskey and Crooked Creeks, T.37N R.3-4E																		
1934	Stream	.8	358	17	4.75	23	6.42	.28			4.47				4.75	5.03		
	Upland	4.6	1,043	10	.96	29	2.78				.86				.96			
1936	Stream	1.8	289	8	2.77	12	4.15				2.77							
	Upland	1.2	299	9	3.01	11	3.68		1.34		3.01							
1937	Stream	4.6	300	87	29.00	518	172.66	.67	5.67	6.00	8.66	10.00	23.00	25.33	29.00	41.66		
	Upland	1.0	84	3	3.57	29	34.52				3.57							
Unworked	Stream	1.8	36															
Total	Stream	9.0	983	112	11.39	553	56.26	.30	1.83	1.93	5.29	5.49	9.46	10.17	11.39	15.36		
	Upland	6.8	1,426	22	1.54	69	4.84		.28		1.47				1.54			
Cow, Rainy, Harvey Creeks, T.37N R.4E																		
1934	Stream	12.4	1,100	132	12.00	541	49.18	.54	.73		11.64	12.27	11.73		12.00	13.18		
1936	Stream	1.1	51	15	29.41	78	152.94				5.88		19.61		29.41	49.01		
Total	Stream	13.5	1,151	147	12.77	619	53.78	.52	.59		11.38	11.99	12.07		12.77	14.77		
Grand Total Stream-Upland		548.1	105,796	7,983	7.54	26,454	25.00	.08	.43	.45	4.71	4.84	5.24	5.42	7.54	8.73		8.74

TABLE NO. 4

PINE DISEASE SURVEY, 1938
SUMMARY BY DRAINAGE AND YEARS OF WORKING, ST. JOE OPERATION

Drainage			White Pine			Cankers		Cumulative Percent of Trees Infected and of Trees Reinfected by Years										
									1929-1931		1932-1933		1934		1935-1936		1937	
Years of Ribes Eradication	Strip Location	Miles of Strip	Number Examined	Number Infected	Per Cent	Number	Per 100 Trees	Up to 1928	New	Rein-fected	New	Rein-fected	New	Rein-fected	New	Rein-fected	New	Rein-fected
West Fork Emerald Creek and Willow Creek, T.42-43N R.1E-1W																		
1933	Stream	5.9	722	30	4.16	215	29.78	.42			3.60		4.16			4.43		
	Upland	27.9	3,918	75	1.91	197	5.03	.23	.59		1.86	1.91			1.91	1.97		
1935	Stream	3.1	774	3	.39	3	.39				.39							
	Upland	10.7	1,740	11	.63	18	1.03				.57				.63			
1936	Stream	.1	31	1	3.23	1	3.23				3.23							
	Upland	2.9	111															
Unworked	Stream	6.4	1,282	51	3.98	63	4.91				1.95		2.26		3.98	4.29		
	Upland	5.1	704	15	2.13	26	3.69				.99		1.13		2.13	2.27		
Total	Stream	15.5	2,809	85	3.03	282	10.04	.11			1.96		2.24		3.03	3.24		
	Upland	46.5	6,473	101	1.56	241	3.72	.14	.36		1.39	1.42	1.40		1.56	1.64		
Elk Creek, T.39N R.2E																		
Stream 1930-1931	Stream	4.1	226	31	13.72	72	31.86		2.21		12.39	12.83			13.72	14.06		
Upland 1935	Upland	.4	21															
Stream 1930-1931	Stream	14.2	829	235	28.35	785	94.69	1.33	5.55	6.39	25.45	27.62			28.35	34.86		
Upland 1936	Upland	3.6	250	51	20.40	134	53.60		4.40		20.00				20.40	23.60		
Total	Stream	18.3	1,055	266	25.21	857	81.23	1.04	4.83	5.50	22.65	24.45			25.21	30.52		
	Upland	4.0	271	51	18.82	134	49.45		4.06		18.45				18.82	21.77		
Thorn Creek, T.45-46N R.1E, 1-2W																		
Unworked	Stream	8.9	649	1	.15	3	.46								.15	.31		
	Upland	.8	203	2	.99	2	.99		.99									
Soldier Creek, T.45N R.1W																		
Unworked	Stream	5.1	193	20	10.36	79	40.93				2.07				10.36	10.88		
	Upland	.7																
Flat Creek, T.45N R.1-2W																		
1935	Stream	.6	46															
Unworked	Stream	10.3	1,002	22	2.20	84	8.38				.20				2.20	2.30		
	Upland	3.6	672															
Total	Stream	10.9	1,048	22	2.14	84	8.02				.19				2.14	2.19		
	Upland	3.6	672															
Beaver Creek, T.44-45N R.1E, 1W																		
Unworked	Stream	8.4	1,452	189	13.02	809	55.72				6.61				13.02	17.77		17.84
	Upland	11.8	4,818	604	12.54	4,504	95.56	.02	.06		6.21	6.23	6.23		12.54	17.27		17.33
West Fork St. Maries River and Bechtel Creek, T.42N R.1-2E																		
1933	Upland	4.2	798	44	5.51	121	15.16	.63	1.75		5.26	5.51			5.51			
1934	Upland	1.4	192	23	11.98	111	57.81	2.60	3.13		11.46	14.06			14.98	16.67		
Total	Upland	5.7	990	67	6.77	232	23.43	1.01	2.02		5.46	7.17			6.77	7.88		
Middle Fork St. Maries River, Merry, Gramp, Placer and Gold Center Creeks, T.42-43-44N R.2-3E																		
1933	Stream	18.3	2,120	763	35.99	2,391	108.07	.99	3.21	3.58	25.00	26.75	26.89	29.29	35.99	42.31		
	Upland	17.8	2,994	650	21.71	1,948	65.06	.99	2.91	3.17	20.54	21.54	20.84	22.01	21.71	24.32		
1932, 1934	Stream	4.8	244	5	2.04	8	3.28				2.04							
	Upland	1.6	151	7	4.64	12	7.95				4.64							
1934	Stream	15.0	1,648	566	34.34	3,006	182.40	1.70	4.92	5.58	31.86	35.56	33.50	38.47	39.34	40.59		
	Upland	4.8	706	157	22.24	430	60.91	1.27	3.40	3.54	21.53	22.95			22.24	24.22		
1935	Stream	2.0	151	39	25.83	86	56.95				21.85				25.83	27.15		
Unworked	Stream	.2	99	51	51.52	168	169.70		3.03		45.45		46.46		51.52	53.54		
	Upland	1.4	479															
Total	Stream	40.3	4,262	1,424	33.41	5,659	132.78	1.15	3.57	4.01	26.70	29.00	28.30	31.42	33.41	39.07		
	Upland	25.6	4,330	814	18.80	2,390	55.20	.85	2.56	2.77	17.88	18.08	18.08	19.12	18.80	20.92		
Marble and Bussel Creeks, T.43-44N R.2-3E																		
1934	Stream	26.1	4,219	795	18.84	2,252	53.28	.12	.50	.57	15.10	16.19			18.84	22.61		
	Upland	31.9	11,147	451	4.05	814	7.30	.01	.07		3.02		3.08		4.05	4.27		
Unworked	Stream	4.9	973	86	8.84	307	31.55				2.88				8.84	10.48		
	Upland	.9	451	5	1.10	6	1.33				.66				1.10			
Total	Stream	31.0	5,192	881	16.97	2,559	49.29	.10	.40	.46	13.54	13.69			16.97	20.34		
	Upland	32.7	11,598	456	3.93	820	7.07	.01	.07		2.93		2.98		3.93	4.15		
Mica Creek, T.44-45N R.1-2E																		
Unworked	Upland	15.9	2,994	665	22.21	1,850	61.79	.07	.23		7.48				20.77	24.38	20.91	25.05
Hugus Creek, T.45N R.1E																		
Unworked	Upland	4.7	1,081	96	8.88	153	14.15		.56		8.05				8.88	9.25		
Bond Creek, T.45N R.1E																		
Unworked	Upland	8.8	2,141	369	17.23	1,685	78.70	.19	1.03		14.15	14.43	14.71		17.23	21.86		
Grand Total		299.5	52,231	6,113	11.70	22,443	42.97	.25	.84	.92	8.56	8.90	8.76	9.18	11.62	13.79	11.63	13.84

TABLE NO. 5

PINE DISEASE SURVEY, 1938
SUMMARY, AREAS WHERE UPLAND RIBES ERADICATION WORK WAS PERFORMED IN 1932
ST. JOE AND CLEARWATER OPERATIONS

Dreinage			White Pine			Cankers		Cumulative Percent of Treee Infected and of Trees Reinfected by Years										
									1929-1931		1932		1933-34		1935-36		1937	
Years of Ribes Eradication	Strip Location	Miles of Strip	Number Examined	Number Infected	Per Cent	Number	Per 100 Trees	Up to 1928	New	Rein-fected	New	Rein-fected	New	Rein-fected	New	Rein-fected	New	Rein-fected
St. Joe Operation																		
Loop Creek (Turkey and Ward Creek) T.46N R.6-7E																		
	Stream	6.7	753	98	13.01	612	81.27		.93		1.33		8.10	8.23	13.01	15.54		16.07
1932	Upland	2.3	827	20	2.42	54	6.53						1.57		2.42	3.02		
	Stream	1.4	552	6	1.09	9	1.63						1.09			1.27		
Unworked	Upland	4.3	2,238	40	1.79	82	3.66		.09		.45		1.52		1.79	2.06		
	Stream	8.1	1,305	104	7.97	621	47.59		.54		.77		5.13	5.21	7.97	9.05		9.82
Total	Upland	6.6	3,065	60	1.96	136	4.45		.07		.33		1.54		1.96	2.32		
Slate Creek, T.46N R.4-5E																		
	Stream	13.2	3,154	86	2.73	153	4.85	.06	.35		1.97		2.66		2.73	2.79		
1932	Upland	6.1	3,530	17	.48	23	.65				.37		.48					
	Stream	2.3	298	24	8.05	125	41.95		.34		1.68		6.04		8.05	8.39		
Unworked	Upland	1.0	347	20	5.76	52	14.99						4.61		5.76			
	Stream	15.5	3,452	110	3.19	278	8.05	.06	.35		1.94		2.95		3.19	3.27		
Total	Upland	7.1	3,877	37	.95	75	1.93				.34		.85		.95			
Grand Total		37.3	11,699	311	2.66	1,110	9.49	.02	.18		.85		2.13	2.14	2.66	2.95		2.98
Clearwater Operation																		
Parallel, Silver, Alder Creeks, T.39N R.5E																		
1932	Upland	15.6	4,292	403	9.30	1,015	23.65	.09	.46		4.01	4.03	8.46	9.15	9.30	11.69		
1934	Upland	3.2	211	7	3.32	12	5.69				1.89		3.32					
1935	Upland	4.1	1,185	171	14.43	551	46.50	.17	.84		6.83	7.00	11.39	11.64	14.43	17.21		
	Upland	8.1	1,741	481	27.63	1,674	96.15		.23		6.60		21.71	22.63	27.63	34.52		
1936	Stream	1.4	186	42	22.58	316	159.89		1.61		8.06		22.04	24.19	22.58	34.41		
1931-1935	Stream	2.5	703	13	1.85	17	2.42				.71		1.71		1.85			
1931-1936	Stream	2.9	484	24	4.96	68	14.05		.21		.62		4.34	4.54	4.96	5.78		
	Stream	6.8	1,373	79	5.75	401	29.21		.29		1.67		5.39	5.75	5.75	11.65		
Total	Upland	31.0	7,429	1,062	14.29	3,252	43.77	.08	.46		5.01	5.04	11.88	12.54	14.29	17.68		
Grand Total		37.8	8,802	1,141	12.96	3,653	41.50	.07	.43		4.49	4.52	10.87	11.49	12.96	16.12		

TABLE NO. 6

PINE DISEASE SURVEY, 1938
SUMMARY BY DRAINAGE AND YEARS OF WORKING, KANIKSU AND CABINET OPERATIONS

Drainage			White Pine			Cankers		Cumulative Percent of Trees Infected and of Trees Reinfected by Yeare										
									1929-1931		1932-1933		1934		1935-36		1937	
Years of Ribes Eradication	Strip Location	Miles of Strip	Number Examined	Number Infected	Per Cent	Number	Per 100 Trees	Up to 1928	New	Rein-fected	New	Rein-fected	New	Rein-fected	New	Rein-fected	New	Rein-fected
Kaniksu Operation																		
Soldier Creek, T.60N R.3W																		
1934	Upland	4.8	9,452	515	5.45	1,090	11.53		.09		1.47	1.48			5.45	5.67		
1937	Upland	1.4	1,955	1,108	56.67	8,059	412.22				.40				56.67	58.23		58.83
Unworked	Upland	1.9	3,152	1,607	50.98	21,393	678.71				2.66				50.98	57.29		57.74
Total	Upland	8.1	14,559	3,230	22.18	30,542	209.78		.06		1.58	1.59			22.18	23.97		24.15
Big Creek, T.57-58N R.3-4W																		
1928	Upland	16.1	6,921	134	1.94	291	4.20		.01		.62		.69		1.94	2.08		2.09
1934	Upland	4.2	1,237	1	.08	1	.08								.08			
Unworked	Upland	3.0	602	3	.49	7	1.16								.49			
Total	Upland	23.3	8,760	138	1.57	299	3.41		.01		.49		.54		1.57	1.68		1.70
Grand Total		31.4	23,319	3,368	14.44	30,542	130.97		.04		1.17	1.17	1.19		14.44	15.60		15.72
Cabinet Operation																		
Middle Fork of Big Creek, T.18-19N R.30-31W																		
	Stream	3.2	276	91	32.90	351	127.17		2.53		12.31	12.68			32.90	42.02		44.20
1936	Upland	1.7	1,037	18	1.73	25	2.41		.48		.77				1.73	2.02		
Unworked	Stream	.6	179	163	91.06	2,000	1117.31		2.79		61.45	63.12	62.01		91.06	153.07		155.86
	Stream	3.8	455	254	55.80	2,351	516.70		2.63		31.64	32.50	31.87		55.80	85.71		88.13
Total	Upland	1.7	1,037	18	1.73	25	2.41		.48		.77				1.73	2.02		
East Fork of Big Creek, T.18-19N R.30W																		
	Stream	.8	52	26	50.00	191	367.30		1.92		15.40				50.00	63.46		
1936-1937	Upland	2.2	897	208	20.06	978	109.03				15.27		15.38		20.06	31.10		31.21
Unworked	Upland	6.7	1,907	362	18.98	1,045	54.80		.10		14.10		14.47		18.98	22.70		
	Stream	.8	52	26	50.00	191	367.30		1.92		15.40				50.00	63.46		
Total	Upland	8.9	2,804	570	20.33	2,023	72.14		.71		14.47		14.76		20.33	25.42		25.46
Grand Total		15.2	4,348	868	19.96	4,590	105.56		.45		13.01	13.11	13.22		19.96	29.73		30.01

[illegible] 1936 the [illegible] about 80 percent [illegible] completely of [illegible] particularly [illegible] at the mouth of [illegible] Creek. This area shows a [illegible] of rust intensification [illegible] 1929 only served to break down the [illegible] ribes population to present control standards [illegible] worked until in 1933 and 1934. [illegible] infections these are only sufficient to indicate [illegible] carefully some small areas where ribes might [illegible] heavy in order to prevent any building up of [illegible]

An interesting [illegible] in this area which [illegible] completely is that apparently there has been a [illegible] upstream from the original [illegible] upstream mainly in [illegible], Harvey and Hollow Creeks [illegible] infections. The spread downstream has been much greater [illegible] what localized [illegible] and a fairly heavy local infection was [illegible] from Delaney in 1935 and 1936. [illegible] also have [illegible]. There is a possibility [illegible] difference in spread may be due partially to a [illegible] in the two locations.

A good deal of work was done in the Coeur d'Alene [illegible] particularly on some of the larger [illegible] Brown, Eagle and Big Creeks.

On the Big Creek area [illegible] a good deal of new infection was found [illegible] in 1934. As this area was reworked by CCC crews in 1936 the [illegible] additional new infection is decidedly [illegible] this area will [illegible] ribes regeneration especially in and near the infection centers.

[illegible] Creek, a branch of the Coeur d'Alene River [illegible] Creek would be considered as giving a good contrast with the Big Creek [illegible] it had not been worked in 1935 and 1936. There has not been as [illegible] on a percentage basis as on the Big Creek area. There [illegible] if ribes eradication work had not been done in 1935 and 1936 [illegible] fication occurred in this [illegible] Creek infection [illegible] these new infections had reached the stage [illegible] all of the ribes had been eradicated. There is some [illegible] to the fact that ribes eradication was [illegible] period started and this illustrates the importance of [illegible] ribes eradication work in 1935 and 1936 there would have [illegible] tremendous increase in the year of 1936.

[illegible] in 1937 [illegible] stream type [illegible] upland [illegible]
therefore include a sample of the stream type. [illegible]
ment were found in Upper [illegible] Creek where ribes regeneration [illegible]
areas but over which ribes eradication work was performed [illegible]
Lower Beaver Creek area where ribes regeneration [illegible]
resulted in additional [illegible] in the upland [illegible]

On the St. Joe operation a good deal of [illegible]
work was continued on the [illegible] on some of the areas worked in 1932 and 1934 [illegible]
[illegible] and the unworked [illegible]. [illegible] large extent of unworked area around [illegible] and Upper [illegible] the [illegible], Beaver and [illegible] Creek [illegible] initial work in these areas. Some work was also done [illegible] Slate and [illegible] Creeks. On this operation [illegible] located [illegible] the stream type. [illegible] upland infection occurs in areas where ribes [illegible] well above eradication standards.

Work on the [illegible] operation was started late in the [illegible] there was time to [illegible] only part of the Soldier Creek and Big Creek [illegible]. On the Soldier Creek area there is some new infection in the [illegible]. There is a significant contrast between [illegible] increase in infection in unworked portions. [illegible] 1937 and 1938 any additional increase in [illegible] working in 1940 will be necessary to prevent a further build-up.

On the [illegible] operation [illegible] Big Creek [illegible] order to determine the amount and intensity of the [illegible] started in 1938. [illegible] on the effectiveness of control. The [illegible] Rivers Creek, a branch of the [illegible] cent on some parts of the [illegible] strips on the Middle Fork of [illegible] Creek where the [illegible] cent. Here the stream [illegible] part of the control area. [illegible] blocks of pine showing a high cost of protection [illegible] doubtful. If this work is continued, however, [illegible] immediately in order to prevent [illegible]

PLANS FOR 1939

During 1939 disease survey work will be [illegible]
Coeur d'Alene operations [illegible] infection centers. [illegible]

[illegible]

by

[illegible]

[illegible]

In order to determine any relationships which may exist between the number of ribes, feet of live stem and the amount of infection on associated white pine under various site conditions, permanent plots [illegible] 1937. In all cases when a plot is established a record is made of [illegible] which are found. In some cases infection data on the pine are [illegible] of the area indicates that some information of value may be obtained. [illegible] are submitted in special reports. In consequence of this procedure [illegible] in various stages of development. Some work is done on them each [illegible] may not provide data for a report for some time. The following [illegible] brief statement of the work done during the 1938 season.

[illegible] Creek plot, T. 3? N., R. [illegible] E., S. 28, in the [illegible] Forest. The ribes had not been eradicated previously but they were [illegible] immediately after taking of data was finished. The plot is [illegible] a 15 year old white pine stand with a ribes population of [illegible]. The ribes present were Ribes lacustre, R. viscosissimum and [illegible]. The plot is three by eight chains. The complete data which were [illegible] submitted in a special report.

[illegible] plot No. 1, T. 3? N., R. [illegible] E., S. 16, in the [illegible] Forest. The ribes were eradicated from this plot in 1932 and [illegible]. [illegible] 1938 eradication a four square chain plot was established with [illegible] viscosissimum with seven feet of live stem in the center. The pines [illegible] and the data will be presented in a special report.

[illegible] plot No. 2, T. 3? N., R. [illegible] E., S. [illegible], in the [illegible] Forest. This plot is in open reproduction and is four chains square. [illegible] had been eradicated in [illegible]. Eradication work was done again around [illegible] 1938. No pine infection data were taken. All ribes on the plot were [illegible] by the plot crew leaving only four R. viscosissimum [illegible] with the following amount of ribes respectively: one bush with one foot of stem, one bush with four feet of live stem, one bush with seven feet [illegible] and three bushes with a total of 12 feet of live stem.

Plot No. 3, T. 3? N., R. [illegible] E., S. [illegible], in the [illegible] Creek area [illegible] Clearwater National Forest. This plot is in four year old dense reproduction. The area was logged in 1934 during a pole operation. Ribes eradication was performed in [illegible]. A four by four chain plot was laid out. All ribes on the plot were eradicated except a clump of R. viscosissimum consisting of [illegible] bushes with [illegible] feet of live stem which were left in the center of the plot. [illegible] ribes on the surrounding area were to have been pulled by the [illegible] ization, but because of a change in their plans they were not [illegible].

Plot No. 4, T. 3? N., R. [illegible] E., S. 10, in [illegible] Creek area of the Clearwater National Forest. The area was clear-cut in 1926 and is now [illegible] stocked with white pine [illegible]. The ribes were eradicated [illegible]

[illegible] in the [illegible] area [illegible] This condition was [illegible] about 1930 [illegible] report on the results of this [illegible]

Plot No. 20, T. 43 N., R. 1 E. [illegible] and near [illegible] small [illegible] from plot No. 19. [illegible] ribes were eradicated except some R. *petiolare* [illegible] located in the center of the plot. The pine [illegible] inspected. Eradication was performed in 192[illegible].

Plot No. 21, T. 42 N., R. 1 E. [illegible] St. Joe National Forest about two miles southeast of plot No. [illegible] an open reproduction type of white pine [illegible] plot all ribes except 326 bushes with 700 feet of live stem [illegible] eradicated. The ribes which were left are well distributed [illegible] eradication was performed in 1935 and the ribes left were [illegible] largely R. *lacustre*. The pines on the plot were inspected. The [illegible] inspection will be the subject of a special report.

Plot No. 22, T. 42 N., R. 1 E., S. 18, [illegible] St. Joe National Forest. This plot is in [illegible] ribes were eradicated in 1930. One hundred eighty-one bushes with [illegible] live stem of R. *lacustre* were left on the plot. The [illegible] chains and the ribes were located and inspected. [illegible] report can be made at this time.

Snake Creek plot, T. 37 N., R. 5 E., [illegible] National Forest. This plot of 3.6 acres was established in 1933 [illegible] eradication work on the area in 1934. In 1935 a record was made of the [illegible] present in each square chain and the [illegible] on the basis of a partial inspection of the pine on the plot. No eradication [illegible] done on the area since 1934. This year the plot was [illegible] on the area were inspected. The area was also [illegible] lateness of the season [illegible] four bushes with 161 feet of live stem of R. *petiolare* and [illegible] feet of live stem of R. *viscosissimum* were found.

Besides determining the effectiveness of [illegible] the Snake Creek plot, data were sought regarding the [illegible] the cankers [illegible] infected [illegible] all cankers which were found were cut out. [illegible] trunk cankers were cut down. Since [illegible] the information will also give some [illegible] older age classes than [illegible] data will be tabulated in a separate report.

[illegible]

[illegible]

The several plots for the [illegible] plot [illegible] formerly only *Ribes viscosissimum* and *R.* [illegible] were [illegible] around the plot but all *R. lacustre* had been left. During [illegible] all ribes around the plot for a distance of ten chains [illegible] the pine on the plot are now subject to infection only from the *R. lacustre* on the plot. During this eradication work [illegible] *R.* [illegible] with 11,380 feet of live stem, two *R. viscosissimum* with 19 feet of [illegible] six *R. inerme* with 2,576 feet of live stem were destroyed.

The main plot was subdivided into five smaller plots [illegible] each other by at least four chains distance of [illegible] were made in the ribes population on three of the plots as shown [illegible]

The objective of the present plots [illegible] infecting power of different amounts of *R. lacustre*.

Again it is recommended that the ribes on the plots [illegible] in August of each year in order to determine whether the [illegible] not. This information would aid greatly in interpreting the [illegible] of it which may be found on the pine, avoid possible errors [illegible] and obtain data on the distance of spread.

It is further recommended that the pines on the plot and [illegible] distance around it should be inspected in the fall of [illegible] the third season since the pines have been subjected to infection [illegible] ribes, a part of which were eradicated in 1935.

TABLE [illegible]

CHANGE IN STATUS OF [illegible]

Ribes and Pine	Former Status Number	Former Status Per Acre	Change to Number	Change to Per Acre	Remarks
		Plot I			
Pine	[illegible]	11	[illegible]	11	Area [illegible]
Pine infected	0	0	0	0	[illegible]
Ribes	[illegible]	[illegible]		[illegible]	[illegible]
Ribes feet live stem	462	42	[illegible]	42	
		Plot II			
Pine	564	40	[illegible]	40	
Pine infected	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Ribes	50?	3	[illegible]	[illegible]	[illegible]
Ribes feet live stem	2,152?	155?	2 [illegible]	[illegible]	
		Plot III			
Pine	400	34	[illegible]	34?	[illegible]
Pine infected	[illegible]	[illegible]	[illegible]		[illegible]
Ribes	[illegible]	24	[illegible]		[illegible]
Ribes feet live stem	19 320	1 606	6 955?	[illegible]	[illegible]
		Plot IV			
Pine	[illegible]	[illegible]	[illegible]	[illegible]	Area [illegible]
Pine infected	[illegible]	[illegible]	[illegible]		[illegible]
Ribes	[illegible]	11	[illegible]	[illegible]	[illegible]
Ribes feet live stem	[illegible]	416?	[illegible]	[illegible]	[illegible]
		Plot V			
Pine	42	31	[illegible]	31	Area [illegible]
Pine infected	[illegible]	[illegible]	55?	[illegible]	[illegible]
Ribes	[illegible]	6	[illegible]	[illegible]	[illegible]
Ribes feet live stem	[illegible]	45	20	[illegible]	[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

The [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

A leader and an assistant leader of [illegible] [illegible] of Plant Disease Control direct the work in the [illegible] [illegible]. Assisting personnel in 1938 consisted [illegible]. The full time personnel responsible for the direction of the work [illegible] [illegible] Forester in charge and Clarence M. Chapman, Chief [illegible] and immediate supervision of the work for the past two [illegible] responsibility of Mr. Chapman.

The continued use of ERA funds for this project [illegible] of only certified reliefers for all positions. These were [illegible] District Works Progress Administration offices only after approval [illegible] by the state office. This procedure delayed assignments more [illegible] years and at times handicapped the project's operation.

WORK AREAS

With only one Colorado ribes eradication camp scheduled [illegible] and the timeliness of second working apparent, the area worked [illegible] Middle Beaver Creek drainage on the [illegible] National Forest was [illegible] addition a small area of necessary initial work in this vicinity was [illegible] the completion of the 1938 work the [illegible] [illegible] working [illegible] the Middle Beaver Creek drainage [illegible] [illegible] working and [illegible] acres of second working.

[illegible]

Further efforts were made to develop the practical usage of [illegible] for eradication on the uplands. Previous tests, [illegible] in 1936, showed that both Diesel oil and [illegible] in the eradication of the two species of ribes most common [illegible] Utilizing these findings, the [illegible] application of each chemical was [illegible] in so far as this procedure was found practical. Although this work [illegible] nature of a routine part of the eradication work, the treated areas [illegible] [illegible] as test units.

Continuing with the study of seedling development, [illegible] in 1937, established plots were examined. Although this work [illegible] [illegible] definite trends of seedling behavior were noted.

In cooperation with the Soil Conservation Service, small [illegible] of fourteen kinds of grass seed were planted on spots from which ribes had been eradicated. The purpose of this test is to determine the [illegible] of certain range grasses to high altitude lands and the possibility of using [illegible] to suppress ribes seedling development.

METHODS AND EQUIPMENT

By far the largest part of the ribes eradication [illegible] [illegible] the grubbing of bushes with a mattock. [illegible]

W 2391. Ribes montigenum killed by Diesel oil drench, Bison Ridge, Pike National Forest, Colorado.

W 2414 Rock bound R. cereum killed by decapitation and diesel oil drench, Pole Mountain, Medicine Bow National Forest, Wyoming

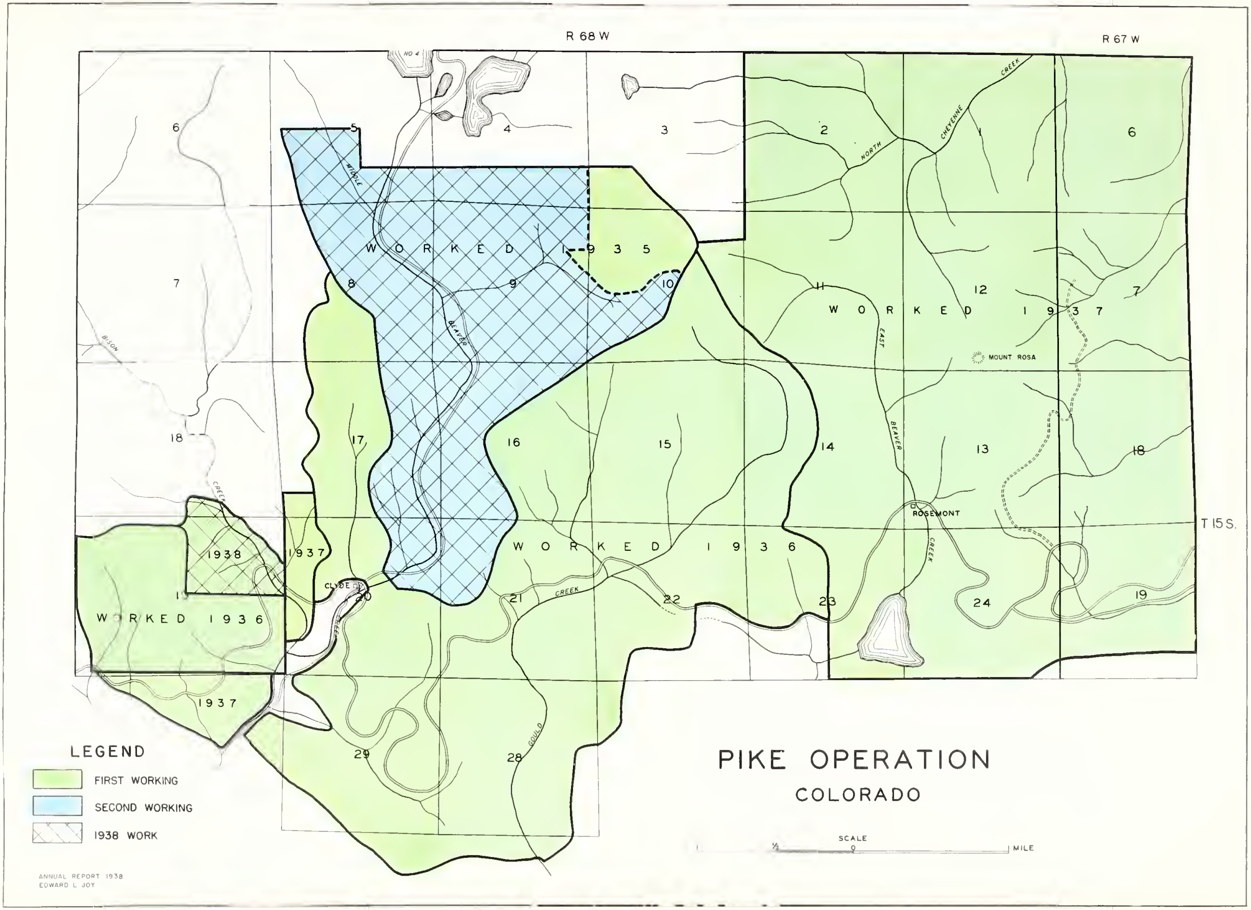
TABLE NO. 6

TOTAL RIBES BY SPECIES ERADICATED, 1935-1938
CENTRAL ROCKY MOUNTAIN REGION

Working	Eradication Type	Acres	Ribes by Species: Ribes montigenum	Ribes cereum	Ribes inerme	Ribes lacustre	Ribes viscosissimum	Ribes leptanthum	Total Ribes
First	Open Reproduction	4,564	36,946	430	3,447				40,823
	Open Pole (Hand)	20,134	226,750	486,647	71,865	17,847	18,309		821,418
	Open Pole (Diesel)	28		110	150				260
	All Open Pole	20,162	226,750	486,757	72,015	17,847	18,309		821,678
	Open Mature	196	1,374	175	93				1,642
	Dense Mature	6,507	174,960		8,118	16,203	727	1,505	201,513
	Burn	1,698	60,431	3,472	8,714	2,543	8,367		83,527
	Sage-Grass	1,279		30,524	322				30,846
	Timberline	73	39,582		826			1,255	41,663
	All Upland	34,479	540,043	521,358	93,535	36,593	27,403	2,760	1,221,692
	Meadow	1,596							
	Stream	544	7,248	1,221	248,245	17,187	827		274,728
	All Types	36,619	547,291	522,579	341,780	53,780	28,230	2,760	1,496,420
Second	Open Pole (Hand)	1,135	35,338	1,405	4,460				41,203
	Open Pole (Atlacide)	11	3,140						3,140
	Open Pole (Diesel)	7	3,220						3,220
	All Open Pole	1,153	41,698	1,405	4,460				47,563
	Burn	809	30,435	1,624	7,264				39,323
	All Types	1,962	72,133	3,029	11,724				86,886
All Workings	Open Reproduction	4,564	36,946	430	3,447				40,823
	Open Pole (Hand)	21,269	262,088	488,052	76,325	17,847	18,309		862,621
	Open Pole (Atlacide)	11	3,140						3,140
	Open Pole (Diesel)	35	3,220	110	150				3,480
	All Open Pole	21,315	268,448	488,162	76,475	17,847	18,309		869,241
	Open Mature	196	1,374	175	93				1,642
	Dense Mature	6,507	174,960		8,118	16,203	727	1,505	201,513
	Burn	2,507	90,866	5,096	15,978	2,543	8,367		122,850
	Sage-Grass	1,279		30,524	322				30,846
	Timberline	73	39,582		826			1,255	41,663
	All Upland	36,441	612,176	524,387	105,259	36,593	27,403	2,760	1,308,578
	Meadow	1,596							
	Stream	544	7,248	1,221	248,245	17,187	827		274,728
	All Types	38,581	619,424	525,608	353,504	53,780	28,230	2,760	1,583,306

[illegible]

[illegible] first [illegible] of the [illegible] [illegible] [illegible] development of [illegible] [illegible] [illegible] further attention particularly with [illegible] analysis, testing of new chemicals and study of the [illegible] flows following stabilization. The third phase, or [illegible] [illegible] the extent of the disease in [illegible] adjacent territory.


PIKE OPERATION
COLORADO
R 68 W
R 67 W
T 15 S.
WORKED 1935
WORKED 1937
WORKED 1936
WORKED 1936
1937
1937
1938
MOUNT ROSA
ROSEMONT
CLYDE
NORTH CHEYENNE CREEK
EAST BEAVER CREEK
MIDDLE BEAVER
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ANNUAL REPORT 1938
EDWARD L JOY

W 2400. Stand of pure Pinus aristata growing on decomposed granite at 11,500-12,000 feet elevation, Mount Baldy, Pike National Forest Colorado

W 2397. Stand of pure P. flexilis at 10,000 feet elevation near Clyde, Pike National Forest, Colorado.

[illegible]

[illegible]

Working	Ribes Species	1935	1936	1937	[illegible]
First	R. montigenum	88.[illegible]	70.[illegible]	7[illegible]	[illegible]
	R. inerme	8.1	12.3	12.[illegible]	[illegible]
	R. cereum	3.6	17.4	10.[illegible]	[illegible]
Second	R. montigenum				[illegible]
	R. inerme				[illegible]
	R. cereum				[illegible]
All Workings	R. montigenum	88.[illegible]	70.3	7[illegible]	[illegible]
	R. inerme	8.1	12.[illegible]	12.[illegible]	[illegible]
	R. cereum	3.6	17.4	10.[illegible]	[illegible]

SPECIAL STUDIES

The study of Ribes regeneration after eradication [illegible] 1937 with the establishment of several plots on localities where [illegible] eradicated in 1935 or 1936. The data secured from these plots in 1937 show that both sprouts and seedlings developed on the [illegible] R. montigenum and R. inerme had been removed. These results [illegible] general seedling germination will commence one year after [illegible] continue at least through the third year. [illegible] of the 1935 [illegible] show that [illegible] on [illegible] the number of seedlings [illegible]

TABLE NO. [illegible]

GROWTH AND REGENERATION OF RIBES FOLLOWING STAGE ERADICATION
PIKE OPERATING [illegible] COLORADO

Species	Year Area Worked	No. Plots	No. Bushes [illegible]	[illegible]	Area Disturbed (Sq. Ft.)	Ribes Regeneration Per [illegible] Sq. Ft. Area Disturbed						
						F. I. S. Sprouts and Old Canes			[illegible]			
						1937	1936	Percent Increase	1937	1936	Percent Decrease	[illegible]
R. montigenum	1935	2	6	[illegible]400	117	80.[illegible]	10[illegible]	[illegible]	454	[illegible]	[illegible]	[illegible]
	1936	1	2	3,000	20	[illegible]	[illegible]	[illegible]	59	80		[illegible]
R. inerme	1935	2	4	[illegible]	38	[illegible]	[illegible]	[illegible]	521	550	5[illegible].1	[illegible]
	1936	1	2	3,000	90	75.0	87.5	11.7	915	500	35.1	[illegible]

[illegible]

[illegible] As a result of [illegible] 1958 [illegible] For this study a [illegible] site [illegible] was selected. [illegible]

[illegible]

1. Elymus Triticoides [illegible]
2. Agropyron [illegible]
3. Bromus [illegible]
4. [illegible]
5. Festuca [illegible]
6. Agropyron Cristatum [illegible]
7. [illegible]
8. [illegible]
9. [illegible]
10. Trifolium [illegible]
11. [illegible]
12. Bouteloua Gracilis [illegible]
13. [illegible]
14. Medicago Sativa [illegible]

On the [illegible] half of the area [illegible] conifer stocking [illegible] The results of this [illegible] show that [illegible] conifers per acre [illegible] constituting [illegible] percent of the [illegible] complete results from this study are shown in Table [illegible]

W 2389. Ribes montigenum grubbed from rocks, Bison Ridge, Pike National Forest, Colorado.

W 2407. Second working with Atlocide spray on R. montigenum. Diesel oil work was performed with same equipment on adjacent area. Eagle Mountain, Pike National Forest, Colorado.

[illegible]

[illegible]

[illegible]

Acres in Checked Area	Acres Checked	Data	[illegible]			[illegible]			All [illegible]		
			Under 6'	Over 6'	All	Under 6'	Over 6'	All	Under 6'	[illegible]	[illegible]
450	19.0	No. Trees per acre	29	65	95	5	8	12	34	[illegible]	[illegible]
		Percent	[illegible]	19.6	[illegible]	1.6	[illegible]	4.6	15.6	[illegible]	[illegible]

Location of study: [illegible]

Diesel Oil [illegible] was applied to [illegible] contiguous [illegible] type on a seven acre tract. On an adjacent 11 acres [illegible] volume solution was used on the same species. This work [illegible] with hand work in the surrounding area. The effectiveness of the [illegible] treatments will be determined from a systematic check [illegible]

ERADICATION RESULTS

An objective of all those responsible for eradication [illegible] the highest possible percentage of total working time on the field [illegible] removal of bushes. Operating in 1938 with only a [illegible] man camp and [illegible] working schedule of [illegible] hours per man month, it was impossible [illegible] desired relation between field time and camp operation. Under [illegible] conditions the [illegible] percent of total [illegible] time that was [illegible] the field during 1938 is considered very satisfactory. This percentage [illegible] slightly higher than the four year Colorado average. Table 4 shows the distribution of [illegible] time by type of work performed.

TABLE NO. 4

ANALYSIS OF [illegible] TIME
[illegible] COLORADO

Time Classification	Man Hours	Man Days	Percent
Ribes eradication	6,334	792	[illegible]
Assisting personnel	[illegible]	[illegible]	[illegible]
Kitchen	[illegible]	[illegible]	[illegible]
Camp maintenance	[illegible]	[illegible]	[illegible]
Camp wood	242	30	[illegible]
Travel	10	1	[illegible]
Contributed (T. S. roads)	146	18	[illegible]
Total	[illegible]	[illegible]	[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

TABLE NO. [illegible]

Eradication Type	Acres	Man Days	Total Sites	[illegible]	Per Acre Basis: Man Days	Sites	[illegible]
Open Pole (Hand)	1,07[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	
Open Pole (Airblast)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Open Pole (Diesel)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
All Open Pole	1,[illegible]	[illegible]	[illegible]		.36	[illegible]	
Burn	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	
All [illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	
Stream	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	
All Types	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	

TABLE NO. [illegible] FIRST [illegible]

Eradication Type	Acres	Man Days	Total Sites	Per Acre Basis: Man Days	Sites	[illegible]	
Open Pole	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
Diesel	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		
All Types	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		

TABLE NO. [illegible] SECOND [illegible]

Eradication Type	Acres	Man Days	Total Sites	[illegible]	Per Acre Basis: Man Days	Sites	[illegible]
Open Pole (Hand)	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	
Open Pole (Airblast)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
Open Pole (Diesel)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
All Open Pole	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	
Burn	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	
All Types	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	

TABLE NO. [illegible]

[illegible]
[illegible]

Working	Dredging Unit Type	[illegible]	[illegible] Development	[illegible]	[illegible]
[illegible]	Open Pole	14[illegible]	[illegible]	[illegible]	
	Stream	[illegible]	6,[illegible]	[illegible]	[illegible]
	All Types	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Open Pole ([illegible])	[illegible]	[illegible],[illegible]49	[illegible]	[illegible]
	Open Pole ([illegible])	11	[illegible] 140		
	Open Pole (Diesel)	[illegible]	[illegible]		
	All Open Pole	[illegible]	[illegible]	[illegible]	
	[illegible]	[illegible]	[illegible]	[illegible]	
	All Types	[illegible]	[illegible]	[illegible]	[illegible]
All [illegible]	Open Pole ([illegible])	[illegible]	[illegible]	[illegible]	
	Open Pole ([illegible])	[illegible]	[illegible]		
	Open Pole (Diesel)	[illegible]	[illegible]		
	All Open Pole	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	Stream	40	[illegible]	[illegible]	[illegible]
	All Types	[illegible]	[illegible]	[illegible]	[illegible]

TABLE NO. [illegible]

[illegible]
[illegible]

Dredging Type	[illegible]	Areas [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Open Pole	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	805	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
All Upland	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
All Types	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[illegible]

TABLE NO. [illegible]

[illegible]	Acres	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Open Pole [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Open Pole [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
All Open Pole	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
All Types	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

TABLE NO. [illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Open Pole [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Open Pole [illegible]	[illegible]	7	300	[illegible]	[illegible]
All Open Pole	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
All Types	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

TABLE NO. [illegible]

Open Pole [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Open Pole [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Open Pole [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
All Open Pole	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
All Types	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Zoning	Reproduction Type	[illegible]	[illegible]	[illegible]	[illegible]
First	Open Reproduction	[illegible]	[illegible]	[illegible]	
	Open Pole (Sand)	[illegible]	[illegible]	[illegible]	
	Open Pole (Diesel)	[illegible]		[illegible]	[illegible]
	All Open Pole	3,[illegible]	[illegible]	[illegible]	[illegible]
	Open [illegible]	198	[illegible]	[illegible]	
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]			
	All Openings	[illegible]	[illegible]	[illegible]	
	[illegible]	[illegible]			
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	All Types	11,[illegible]	[illegible]	[illegible]	[illegible]
Second	Open Pole (Sand)	[illegible]	[illegible]	[illegible]	[illegible]
	Open Pole (Artesian)	[illegible]	[illegible]		
	Open Pole (Diesel)		[illegible]		
	All Open Pole	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	All Types	[illegible]	[illegible]	[illegible]	[illegible]
All Zoning	Open Reproduction	[illegible]	[illegible]	[illegible]	[illegible]
	Open Pole (Sand)	[illegible]	[illegible]	[illegible]	[illegible]
	Open Pole (Artesian)	[illegible]	[illegible]		
	Open Pole (Diesel)	[illegible]	[illegible]	[illegible]	[illegible]
	All Open Pole	[illegible]	[illegible]	[illegible]	[illegible]
	Open [illegible]	198	[illegible]	[illegible]	
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]			
	All Openings	16,[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]			
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	All Types	16,[illegible]	[illegible]	[illegible]	[illegible]

[illegible]

In [illegible] first working [illegible] were completed in 1938 [illegible] close to the average per acre of [illegible] man days [illegible] first working, only [illegible] man days were required [illegible] second working. This reflects the fact that although [illegible] 80 percent as many [illegible] in 1938, the average [illegible] smaller and therefore [illegible] less [illegible]. [illegible] three classes [illegible] in the order of their relative abundance [illegible] from [illegible] (2) seedlings, and (3) [illegible] during the first working. [illegible] for the highest percentage [illegible] of which come from the small [illegible] in many instances are buried under [illegible]. The distribution [illegible] those eradicated during the second working [illegible] distribution [illegible] during the initial [illegible] for 32 to 33 percent.

Following the 1938 [illegible] acres [illegible] considered for classification as (1) on maintenance, (2) [illegible] in 1940, or (3) requiring third working in 1941. [illegible] checking records were analyzed to determine the portion of the [illegible] no more than a very small amount of work in the future [illegible] that will require [illegible] before a final decision is made [illegible] third working [illegible] three years. The results of this classification show that [illegible] acres [illegible] percent [illegible] now on maintenance and the balance, [illegible] acres, will require a third [illegible] 1941. [illegible] considerations [illegible] classification on maintenance [illegible] additional working.

The classification of worked areas [illegible] standards established for the Inland Empire [illegible] detailed studies of the [illegible] in relation to the environment [illegible] such studies have been possible in the Central Rocky Mountain [illegible] recognized that the differences in the species [illegible] and the general climatic conditions in the two regions are sufficient to account for some differences in the [illegible] what these may be, however, it is believed that the control [illegible] established for the Inland Empire are sufficiently [illegible] for tentative use in the classification of Central Rocky Mountain [illegible].

[illegible] OF RIBES [illegible]

[illegible]

INTRODUCTION

The activities of the [illegible] project [illegible] included [illegible] in 1957 [illegible] and the design and testing of improved equipment. [illegible] chemistry and ecology work is given in this report. [illegible] work is presented by [illegible] in another part of the report.

Prior to 1958 the primary objective of the [illegible] Empire had been the chemical eradication of Ribes. The [illegible] Ribes ecology. [illegible] Inland Empire [illegible] work problems. The majority of [illegible] populations have not been [illegible] methods [illegible] Problems in the conduct of maintenance work which [illegible] the subject of laboratory and field tests. [illegible] reproduction of Ribes [illegible] disturbed areas.

The results of Ribes ecology [illegible] are presented in two parts, one describing the effect of [illegible] of upland Ribes, and the other [illegible] to Ribes eradication methods. [illegible]

EXPERIMENTAL WORK [illegible] OF RIBES [illegible]

Results of 1957 chemical test work in the [illegible]

The results of [illegible] are presented in Table 1. [illegible]

[illegible]

[illegible]

Location	Plot[a] Number	Gallons Solution Per Acre	Pounds Chemical Per Acre	Number Snakes [illegible]	Percent Dead Stems	Percent [illegible]
Crystal Creek	1	800	800	72	[illegible]	[illegible]
	2	1,200	1,200	60	[illegible]	[illegible]
	3	1,600	1,600	38	[illegible]	[illegible]
St. Marys River	1	800	800	[illegible]	[illegible]	[illegible]
	2	1,200	1,200	[illegible]	[illegible]	[illegible]
	3	1,600	1,600	[illegible]	95	[illegible]

[a]All plots 1 square rod in size.

[illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
4	[illegible]	1 800 gals	[illegible]	99	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	99	[illegible]

[illegible]

[illegible]

[illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[illegible]

[illegible]

TABLE NO. [illegible]

[illegible]

Site Number	[illegible]	[illegible]	[illegible]	[illegible]
1	[illegible]	[illegible]	[illegible]	[illegible]
2	Drop inlet [illegible]	[illegible]	[illegible]	[illegible]
3	Drop inlet through [illegible]	[illegible]	[illegible]	[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

Date of Work	[illegible]	[illegible]	Acres [illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Colorado [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Colorado Camp C-1 [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	Colorado [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Data in tables [illegible] control [illegible] the combination of [illegible] Diesel oil [illegible] are about equally effective as ribicides on intact R. [illegible] and [illegible] R. [illegible]. Because of the slightly greater [illegible] of the [illegible] mixture and the additional work required to prepare [illegible] Diesel oil in mixture with crude oil or [illegible] oil is recommended for chemical work in Wyoming and Colorado.

Sodium ethyl xanthate did not prove sufficiently [illegible] to warrant further consideration as a ribicide. This conclusion is confirmed by the results of plot tests with the same chemical in Idaho and Cal[illegible]

The encouraging feature of the 1947 chemical work in the [illegible] Mountain Region was the effective work done by the crews on [illegible] R. cereum and intact R. montigenum. With no previous experience [illegible] applied chemical in a satisfactory manner. In both [illegible] plots (first two tests reported in table [illegible]) [illegible] of R. [illegible] rooted among large boulders were killed. A small [illegible] little more experience in applying [illegible] of the crews [illegible] success would have substantially reduced the [illegible] Either [illegible] or Diesel oil can be used effectively for the [illegible] intact R. montigenum. Where water is available [illegible] to the area to [illegible] and where oil would have to be packed [illegible] about equally [illegible] needed for each [illegible] R. montigenum [illegible] oil will be the cheapest ribicide to use.

Considerably [illegible] results were obtained [illegible] treatment of intact [illegible] R. cereum [illegible] possibilities [illegible] R. cereum [illegible] The large [illegible] application of oil in the [illegible] should be the [illegible] method of application.

A [illegible] R. cereum [illegible]

Field work of 1948

For the field season of 1948 the chemical work in [illegible] was restricted to [illegible] and Diesel oil [illegible] R. montigenum. No work was done in Wyoming. A summary of the [illegible] work is given in table [illegible].

[illegible]

[illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	87	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]
[illegible][1]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible][2]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[1] [illegible]

[2] [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible] investigations and [illegible] management [illegible] their activities [illegible] white pine type. [illegible] the [illegible] Station in 1950 joined in a cooperative undertaking [illegible] improvement work on the ribes [illegible] responsibilities of the two agencies [illegible] dated August 15, 1950.

Prior to 1950 ecology studies were [illegible] phases of the germination and growth of ribes and with the effects of logging on [illegible] ribes. [illegible] 1950 the Blister Rust Control Office [illegible] established a series of ribes ecology studies [illegible] in the Deception Creek area. [illegible] ecology work at the [illegible]

It is generally recognized that improvement [illegible] pine on the better sites. [illegible] desirable species is increased [illegible] prefers white pine [illegible] the better white pine areas be [illegible] at full productivity [illegible] be made to produce higher values [illegible] work.

The results of previous ecology studies [illegible] ultimate control of blister rust [illegible] into consideration. The first is that the forest floor [illegible] usually contains large numbers of viable ribes seed [illegible] mantle is [illegible] disturbed. The second is that [illegible] combined with severe ground disturbance [illegible] development of the ribes following [illegible] (1) to control the germination of dormant ribes seed and [illegible] inhibit the subsequent establishment of the [illegible]

The studies herein reported were undertaken [illegible] lizing previously established ribes ecology plots for [illegible] stand improvement in the western white pine type on the [illegible]

[illegible] disturbance of the forest floor [illegible] seed [illegible] germinate [illegible] upon the type of year the disturbance occurs [illegible]. In general, the peak of germination for R. [illegible] year in advance of the peak for R. lacustre. [illegible] followed by the peak of germination during the second year [illegible] the third year for R. lacustre. [illegible] germination is practically complete for R. viscosissimum [illegible] R. lacustre the fourth year. Those seedlings germinating [illegible] a high rate of mortality or are unable to develop normally [illegible] competition. After disturbances other than fire the number of [illegible] will usually be proportional to the degree of disturbance to which the [illegible] floor is subjected.

The first fruiting of R. viscosissimum has been observed on [illegible] old plants while the youngest observed fruit bearing R. lacustre [illegible] of age. In neither case was the quantity of fruits large. The [illegible] in seed production is reached when the plants [illegible] shortage then begins when the increasing [illegible] natural means or by the plants removal and destruction of [illegible]

When Ribes seed germinate in the closing forest stand [illegible] subjected to such severe competition for light and moisture that [illegible] become permanently established. Those seed that fall to [illegible] find their way to the bottom of the organic mantle either through [illegible] sifting process or through the slow disintegration of the duff [illegible] years. If the degree of shading, competition and [illegible] developing forest cover are unfavorable for Ribes plant development [illegible] a time when an area which once supported large Ribes populations [illegible] R. viscosissimum and practically free of R. lacustre. [illegible] developing forest, being in a state of dormancy the multitude [illegible] lie buried within the organic mantle [illegible] stand improvement [illegible] work or some other major disturbance [illegible] conditions which once more are favorable for the growth [illegible]. When such dormancy is broken the number to germinate will [illegible] the quantity of viable seed, the amount of disturbance [illegible] undergoes and the extent to which the forest canopy is opened.

METHODS

The field procedure employed in examining the Ribes [illegible] stand improvement plots was designed to take advantage of the [illegible] boundaries and to some extent followed the silvicultural [illegible] Experiment Station. A string boundary was laid around each [illegible] and the interior gridironed by additional string lines. The width [illegible] between lines was governed by the type and density of the stand and [illegible] men available to complete a 100 percent check of the area. Data were [illegible] separately for each Ribes species by each year of germination, [illegible] leaves per bush and the amount of infection for each seedling [illegible]

[illegible]

[illegible] stand table [illegible] average [illegible] for the entire plot [illegible] ribes was determined [illegible] were listed by species in the order of their abundance and of the [illegible] area occupied.

The sample acres studied, [illegible] units were checked at the conventional [illegible] contiguous milacre [illegible] area at chain intervals. [illegible] ribes seedling. A similar estimate was made of the [illegible] vegetative cover. For each of the areas examined the intensity of [illegible] the canopy expressed in terms of percent full sunlight [illegible] mined by the Experiment Station. Areas on which no [illegible] were mentally compared with stands of known light intensity [illegible] was estimated along the strip at chain intervals. [illegible] chain intervals as being light, medium or heavy and then [illegible] check an average classification was recorded. All ribes seedlings were [illegible] from within the permanent sample plots and along the [illegible] the recording of data and the protection of the experimental [illegible]

The mature ribes bushes [illegible] establishment of the silvicultural plots were removed after recording of the required data. An examination was also made for ribes seedlings and [illegible] recorded for each. An internode count was made to determine the year of germination of all ribes. In case of doubt or where it was impossible to make [illegible] count for [illegible] the root crown [illegible]. Where [illegible] show silvicultural information to explain the type and nature of treatment the data secured by the Experiment Station have been used.

STAND IMPROVEMENT IN IMMATURE STANDS

CLEANING

Definition: Cuttings made in young stands [illegible] diameter breast high for the purpose of removing undesirable trees [illegible] or shrubs that are injuring or are likely to injure [illegible] through "weeding".

Location, Description and Treatment of Stands

Deception Creek Experiment Station, Coeur d'Alene National Forest

Permanent sample plots Nos. [illegible], 42, 43, 45. A [illegible] stand composed of western white pine, western hemlock and [illegible] and white fir [illegible] class. A [illegible] wood stand of mature hemlock and white fir formerly [illegible] over the area. This overwood was removed by felling the mature [illegible] the time of the cleaning. Cleaning removed approximately [illegible]

[illegible] disposed of by piling and burning during [illegible] Ribes eradication was done on this area prior to the establishment of the [illegible] control plots. Approximately [illegible] R. lacustre bushes per acre were [illegible] R. viscosissimum. Moist conditions on this north exposure [illegible] establishment of R. lacustre seedlings. The treated and untreated plots [illegible] shown in photographs Nos. F-2468 and F-2470.

Permanent sample plots Nos. 37 and 38 - A reproduction stand of [illegible] pine, white fir, and hemlock which was largely dominated by white pine. [illegible] removed approximately 77 percent of an original per acre stocking of [illegible] seedlings over 0.5 inches d.b.h. Except for experimental purposes cleaning [illegible] usually necessary in a stand dominated by white pine. On these plots [illegible] overhead shade and there had been no slash disposal work done. The [illegible] were eradicated prior to the establishment of the plots and approximately 80 R. lacustre bushes per acre had been removed. There were no R. [illegible] on the area.

Permanent sample plots Nos. [illegible] - A reproduction stand composed of white pine, white fir, hemlock, and [illegible] large percentage of dominant white fir and hemlock. An overstory of [illegible] seed trees provided a light to medium overhead shade which was removed [illegible] time of the cleaning. Treatment removed approximately [illegible] percent of [illegible] per acre stocking of [illegible] tree seedlings over one foot in height. [illegible] scattered and left on the area. Eradication measures were applied [illegible] establishment of the plots. Approximately [illegible] R. lacustre bushes per acre were removed and no noticeable R. viscosissimum. Conditions on part of the area [illegible] quite favorable for the establishment of Ribes. The treated stand is shown in photographs Nos. F-2471 and F-[illegible].

Extensive sample areas Nos. 35-a and 35-b - Refer to permanent sample plots Nos. [illegible], 42, 44 and 45.

Extensive sample area No. [illegible] - Refer to permanent sample plots [illegible] to 57.

Upper West Branch of Priest River, Kaniksu National Forest

Permanent sample plots Nos. 163 and 164 - A reproduction stand composed of white pine, hemlock, white fir, larch, and cedar, which was dominated by [illegible] and white pine. A light overhead shade from white pine seed trees was present at the time of the cleaning. Treatment removed about 54 percent of an original per acre stocking of 2,600 tree seedlings over one foot in height. Slash was disposed of by piling and burning during the fall of 1936. Eradication measures were applied to this area prior to the establishment of the experimental plots. Approximately 80 Ribes per acre, about evenly divided between the two species, were removed.

Permanent sample plots Nos. 165, 166 and 167 - A reproduction stand of white pine, larch, white fir, hemlock, and cedar, strongly dominated by [illegible] larch. Cleaning removed about 64 percent of an original per acre stocking of [illegible] tree seedlings over one foot in height. No overhead shade was [illegible]

W 2468. Deception Creek Experiment Stotion, Permanent Somple Plot No. 44. An untreoted stond of white pine, hemlock ond white fir, dominated by hemlock ond white fir with o medium to heovy overwood stond of hemlock ond white fir. Ribes definitely on the decline.

W 2470. Deception Creek Experiment Station, Areo No. 36-A. Some stand os in W 2468 but reproduction "weeded" to fovor white pine. Undesiroble residual stand felled or girdled, slashed piled ond burned. Conditions fovoring the germinotion ond survivol of ribes seedlings.

W 2471. Deception Creek Experiment Stotian, Permonent Sample Plot No. 55. A treoted reproduction stand of white pine, white fir, hemlock ond lorch thot had a large percentage of dominont white fir and hemlock. White pine seed trees removed at time of cleoning, slosh scattered. Ribes slowly on the decline due to unfavorable site.

W 2472. Deception Creek Experiment Station, Permanent Sample Plot No. 50. In some stond shown in W 2471. Note condition of scattered slash ond scorcity of vegetotive cover three years ofter treatment. A few sites often occur fovoring the establishment of ribes seedlings.

W 2466. Kaniksu National Forest, Permanent Sample Plot No. 166. An untreated reproductian stand of white pine, larch, white fir, hemlock and cedar, dominated by western larch. Note the brush and the suppressed white pine in foreground. Ribes on the decline.

W 2467. Kaniksu National Forest, Permanent Sample Plot No. 165. Same stand as in W 2466, but reproduction "weeded" to favor white pine, slash piled and burned. Dry, well drained site unfavorable for the survival of ribes seedlings.

TABLE NO. 1

EFFECT OF CLEANING IMMATURE STANDS ON THE GROWTH OF VETERAN RIBES LACUSTRE BUSHES

Silvicultural Data						Ribes Ecology Data																
Plot No. and Location	Plot Treatment	Year Established	Age of Stand When Treated	Stand Density (Trees Per Acre) Before Treatment	Stand Density (Trees Per Acre) After Treatment	Acreage Checked	No. Ribes Per Acre	Total F.L.S. Per Acre Before Treatment	Annual Ribes Growth After Treatment (Feet of Live Stem) Per	1935	1936	1937	1938	Total F.L.S. Per Acre All Years	F.L.S. Per Bush	No. Leaves Per Bush	No. Infected Bushes Per Acre	No. Infected Leaves Per Acre	Exposure	Soil Moisture Content	Amount Associated Vegetative Cover (Percent)	Light Intensity (Percent Full Sunlight)
33									Acre	31.9	34.4	43.1	48.4									
D.C.E.S.[a]	Treated	1934	20	4,800[c]	1,100[c]	.25	40	128.9	Bush	.80	.86	1.08	1.21	286.7	7.20	98	20	96	E	Low	52	65
32									Acre	27.4	25.4	25.4	20.8									
D.C.E.S.	Untreated	1934	20	4,800[c]	4,800[c]	.25	28	180.2	Bush	.98	.91	.91	.74	279.2	10.0	48	4	4	E	Moderate	36	40
42,43									Acre	13.8	15.1	16.0	18.5									
D.C.E.S.	Treated	1935	14	18,000	5,000	.2	15	46.6	Bush	.92	1.00	1.07	1.23	110.0	7.33	138	5	10	N	Moderate	83	85
44,45									Acre	13.6	15.0	14.7	14.4									
D.C.E.S.	Untreated	1935	14	18,000	18,000	.2	70	70.6	Bush	.19	.22	.21	.21	128.3	1.83	13			N	Moderate	40	15
36-A									Acre	9.9	13.2	12.9	13.6									
D.C.E.S.	Treated	1935	14	18,000	5,000	2.2	13	54.3	Bush	.79	1.1	1.0	1.1	103.9	7.99	111	5	25	N	Moderate	62	85
36-B									Acre	2.3	2.6	2.2	3.1									
D.C.E.S.	Untreated	1935	14	18,000	18,000	.9	21	10.0	Bush	.11	.12	.10	.26	20.2	.96	7	2	2	N	Moderate	24	15
49,50,52,54,55,56									Acre	16.4	26.4	29.3	31.2									
D.C.E.S.	Treated	1935	16	7,800	1,400	.6	72	48.8	Bush	.23	.37	.41	.43	152.1	2.11	28	4	4	NW	Low	38	65
51,53,57									Acre	15.4	13.1	16.5	18.2									
D.C.E.S.	Untreated	1935	16	7,800	7,800	.3	43	139.1	Bush	.36	.31	.38	.42	202.3	4.70	55			NW	Low	34	55
2									Acre	14.8	23.1	36.3	34.8									
D.C.E.S.	Treated	1935	16	7,800	1,400	1.1	55	95.3	Bush	.27	.42	.66	.63	204.3	3.71	64	3	14	N	Low	36	70
164									Acre	5.6	6.9	7.0	11.5									
Kaniksu N.F.[b]	Treated	1935	10	2,600	1,200	.9	21	18.2	Bush	.27	.33	.33	.55	49.2	2.34	32			N	Low	79	60
163									Acre	8.5	13.7	11.0	13.1									
Kaniksu N.F.	Untreated	1935	10	2,600	2,600	.9	19	17.5	Bush	.45	.72	.58	.69	63.8	3.36	45			N	Low	65	40
165,167									Acre	.5	.7	.9	.6									
Kaniksu N.F.	Treated	1935	8	7,800	2,800	.8	1	.3	Bush	.40	.56	.72	.48	3.0	2.40	23			W	Low	58	90
166									Acre													
Kaniksu N.F.	Untreated	1935	8	7,800	7,800	.4			Bush										W	Low	33	55

[a]D.C.E.S.- Deception Creek Experimental Station, Coeur d'Alene National Forest.
[b]Kaniksu N.F.- Upper West Branch of Priest River, Kaniksu National Forest.
[c]Treatment applied to tree seedlings over 0.6 inches d.b.h., treatment of remaining plots includes all tree seedlings over one foot in height.

TABLE NO. 2

EFFECT OF CLEANING IMMATURE STANDS ON THE GROWTH AND REGENERATION OF RIBES LACUSTRE SEEDLINGS

Plot No. and Location	Treated or Untreated	Year Plot Established	Acreage Checked	Number Seedlings and Amount Live Stem Per Acre Each Year After Treatment										Accumulative Number Seedlings and Amount Live Stem Per Acre Each Year After Treatment										F.L.S. Per Seedling	No. Leaves Per Seedling	No. Infected Seedlings Per Acre	No. Infected Leaves Per Acre	Exposure	Soil Moisture Content	Amount Associated Vegetative Cover (Per Cent)	Light Intensity (Per Cent Full Sunlight)
				1934		1935		1936		1937		1938		1934		1935		1936		1937		1938									
				No.	F.L.S.	No.	F.L.S.	No.	F.L.S.	No.	F.L.S.	No.	F.L.S.	No.	F.L.S.	No.	F.L.S.	No.	F.L.S.	No.	F.L.S.	No.	F.L.S.								
33 D.C.E.S.[a]	Treated	1934	.25							12	1.2									12	1.2	12	3.8	.32	6			E	Low	52	65
32 D.C.E.S.	Untreated	1934	.25	8	3.1	16	1.7	12	1.0	32	2.7	4	.3	8	3.1	24	8.5	36	13.0	68	21.3	72	28.2	.39	6	8	24	E	Moderate	36	40
42,43 D.C.E.S.	Treated	1935	.2			10	2.0	50	9.0	80	7.0	10	.5			10	2.0	60	17.5	140	46.0	150	76.7	.51	13			N	Moderate	83	85
44,45 D.C.E.S.	Untreated	1935	.2					5	.4									5	.4	5	1.0	5	1.3	.26	5			N	Moderate	40	15
36-A D.C.E.S.	Treated	1935	2.2			8	5.1	30	17.7	37	19.5	3	1.3			8	5.1	38	32.3	75	87.3	78	141.6	1.81	19	6	59	N	Moderate	62	85
36-B D.C.E.S.	Untreated	1935	.9					3	.1	6	.6	2	.1					3	.1	9	.8	11	1.9	.17	7			N	Moderate	24	15
49,50,52,54,55,56 O.C.E.S.	Treated	1935	.6			2	1.1	12	5.1	6	1.3					2	1.1	14	7.4	20	14.9	20	19.6	.98	17	2	2	NW	Low	38	65
51,53,57 D.C.E.S.	Untreated	1935	.3			3	1.3	15	7.4	8	1.6					3	1.4	18	10.3	26	20.7	26	27.5	1.10	17	2	2	NW	Low	34	55
2 D.C.E.S.	Treated	1935	1.1					3	.3	12	1.6	2	.1					3	.3	15	3.1	17	7.8	.46	12	1	1	N	Low	36	70
164 Kan. N.F.[b]	Treated	1935	.9					1	.1									1	.1	1	.2	1	.3	.31	9			N	Low	79	60
163 Kan. N.F.	Untreated	1935	.9																									N	Low	65	40
165,167 Kan. N.F.	Treated	1935	.8																									W	Low	58	90
166 Kan. N.F.	Untreated	1935	.4																									W	Low	33	55

[a]D.C.E.S. Deception Creek Experimental Station, Coeur d'Alene National Forest
[b]Kan. N.F. Upper West Branch of Priest River, Kaniksu National Forest
Refer to Table No. 1 for Silvicultural Data

[illegible] either the sites of [illegible] burning [illegible] Douglas fir [illegible] originating on [illegible] large piles [illegible] proved to appear on burned areas [illegible] Further [illegible] pine seed.

It was found on the cleared area No. 58 [illegible] permanent sample plots Nos. 42 and 43 that better than 50 percent of [illegible] germinating were either within or closely adjacent to burned brush piles. Practically all the seedlings within the burned area [illegible] on boundary of the burned piles. [illegible] seedlings found adjacent to and around the burned piles [illegible] result of mechanical disturbance accompanying the burning [illegible] tion of brush piles which required considerable movement [illegible] near the edge of the piles [illegible] affect the germination of pine seed. This disturbance would [illegible] company progressive cleaning up [illegible] merely scattered [illegible] the seedlings found on this area would not have [illegible] been assembled into piles and burned. The burning of slash [illegible] the only factor of practical importance favoring the germination [illegible] in a cleaning operation.

Growth of shrubs and other vegetation was [illegible] slash was burned. Shrub growth was [illegible] had been scattered and left unburned [illegible] All of the present studies show that the [illegible] left unburned creates conditions largely unfavorable for the [illegible] seedlings.

Thinning

Definition: A cutting made in a [illegible] stand [illegible] the increment [illegible] growth rate of the trees that are left and of [illegible] tion and quality of the timber.

Location, Description and Treatment of Plots

Deception Creek Experimental Station (Coeur d'Alene National Forest)

Permanent sample plots Nos. [illegible] pole was occupying a [illegible] slope [illegible] with white fir, Douglas fir and a little ponderosa pine [illegible] the stand. [illegible] species. Most of the slash was [illegible] small piles [illegible] was piled and progressively burned [illegible] small amount was lopped and left unburned. [illegible] prior to the establishment of the plots [illegible] approximately [illegible]

[illegible] R. [illegible]
[illegible]

Permanent sample plot No. 35, [illegible] stand on northeast slope was composed of about [illegible] white pine, [illegible] white fir with smaller amounts of hemlock and Douglas fir. [illegible] removed practically all suppressed and intermediate trees [illegible] codominant trees of poor form and condition. From [illegible] trees per acre were girdled and the smaller trees felled. The slash [illegible] lopped and placed as close to the ground as possible [illegible] crown thinning. The same stand description and treatment of slash [illegible] under low thinning. The best trees for future growth, [illegible] whenever possible, were selected and released from competition [illegible] the crowns. Noncompeting trees including practically all suppressed [illegible] most of the intermediate trees were left uncut. Moist conditions [illegible] east exposure favored the establishment of R. lacustre.

Permanent sample plots Nos. 46, 47, 48 and 49 - A dense [illegible] north slope consisting mainly of hemlock with the balance composed of [illegible] and white fir with a little Douglas fir and alpine fir. A heavy thinning [illegible] above favoring white pine released trees of this species wherever [illegible] capable of becoming final crop trees. Only trees materially hindering [illegible] selected trees were cut. Most of the suppressed and a large share of the [illegible] mediate trees were left uncut. Fire hazard [illegible] intervals of fire breaks [illegible] the area [illegible] and burning. On the rest of the area slash [illegible] the ground as possible. Unusually heavy snow and wind break [illegible] of the area which resulted in abnormal disturbance. Ribes were [illegible] this area prior to the establishment of the experimental plots. [illegible] 80 R. lacustre bushes were [illegible] per acre. Moisture highly favorable [illegible] lishment of ribes but shading was still too severe for normal growth. [illegible] stand is shown in photograph No. W-2476.

Fourth of July Canyon, Coeur d'Alene National Forest

Permanent sample plots Nos. 38, 39, 40 and 41 - This was a [illegible] very dense stand of white pine and larch with lesser amounts of white fir and Douglas fir on an east exposure. An understory of cedar and hemlock [illegible]. The stand was thinned from below to favor white pine with larch as second choice. A cedar understory was left and all other trees were cut in the thinning. The slash was progressively burned in small piles within the stand during the fall. No eradication work was performed on this area before the completion of the ecology check. The area was distinctly a R. viscosissimum site as evidenced by the results of the check.

Dale Spur, Clarkia, Idaho, St. Joe National Forest

Sample areas Nos. A, B and C - A very dense and vigorous stand was dominated by white pine with lesser amounts of white fir, Douglas fir, [illegible] larch, cedar, and hemlock on south and northeast exposures. The thinning from below to favor white pine removed all suppressed and intermediate trees and [illegible] "wolf" trees were felled. The slash was progressively burned in small piles.

W 2473. Deception Creek Experiment Station, Permanent Sample Plot No. 26. A heavy thinning from below in a very dense stand of white pine, white fir, Douglas fir and lodgepole pine. Conditions favor the establishment of many ribes seedlings on moist exposures.

W 2476. Deception Creek Experiment Station, Permanent Sample Plot No. 48. A heavy thinning from above in a very dense stand of white pine, hemlock, white fir, Douglas fir and alpine fir. Photograph does not illustrate typical treatment because of unusually heavy snow and wind throw. Conditions moderately favorable for germination of ribes seed, mortality of seedlings extremely high under these conditions.

[illegible]

Priest River Experiment Station, Kaniksu National Forest

Permanent sample plots Nos. 157, 158, 159, 159 and [illegible] and well stocked stand was composed of white pine, larch, [illegible] with an understory of cedar. Thinning from below removed all [illegible] trees in the lower crown classes, white pine, larch and cedar [illegible] treatment. The slash was piled and burned in small piles [illegible] the late fall. Eradication measures were applied in 1934 [illegible] mately 105 ribes per acre were removed; they were [illegible] species R. lacustre and R. viscosissimum.

DISCUSSION

Thinning is essentially similar to cleaning in character [illegible] dense stands usually between 20 and 50 years of age where the [illegible] are badly in need of release. Two general systems of thinning [illegible] the low and the crown are applicable. The low thinning or thinning [illegible] essentially an anticipation of the natural thinning which goes on [illegible] To date this method has been more extensively employed than the [illegible] the white pine type. Crown thinning or thinning from above [illegible] development of the stand a long time in advance and the trees which [illegible] for the final stand are selected and favored early in life. The [illegible] either type of thinning on the ecology of ribes will largely depend upon the extent to which the stand is opened, the amount of ground disturbance [illegible] ing the operation, and the subsequent treatment of the slash. [illegible] different weights of thinning, ribes might be expected to appear in [illegible] portion to the extent to which natural conditions are changed. [illegible] effect of the heavy thinning of dense stands is the increased [illegible] the residual trees to wind throw and snow breakage. Such disturbance [illegible] affect the germination and survival of ribes seedlings.

Ribes populations in dense pole stands have for a long period [illegible] been subjected to such severe competition that many areas in need of [illegible] found to be relatively free of ribes. If ribes are present in these [illegible] are usually R. lacustre which will be found in moist and fairly [illegible] bushes are usually large, partially decadent veterans bearing [illegible] few leaves on the terminal growth. Such bushes are not considered [illegible] hazardous and once removed the areas should be protected for an [illegible] No major ribes seedling problem has been known to develop on such areas [illegible] natural conditions are materially altered. The status of control [illegible] will therefore be dependent upon the extent to which thinning is [illegible] dense stands.

The results showing the effect of the two types of thinning on [illegible] of veteran ribes bushes are presented in Table 2. Ribes responded [illegible] well immediately after each type of thinning. Heavy low thinning [illegible] favors the progressive development of live stem although the [illegible] ribes bushes per acre is hardly sufficient for reasonable proof. [illegible]

TABLE NO. 3

EFFECT OF THINNING IMMATURE STANDS ON THE GROWTH OF VETERAN RIBES LACUSTRE BUSHES

Plot No. and Location	Degree of Thinning	Year Plot Estab-lished	Age of Stand When Treated	Stand Density (Trees Per Acre) Before Treatment	Stand Density (Trees Per Acre) After Treatment	Acreage Checked	No. Ribes Per Acre	Total F.L.S. Per Acre Before Treatment	Annual Ribes Growth After Treatment Feet of Live Stem: Per	1935	1936	1937	1938	Total F.L.S. Per Acre All Years	F.L.S. Per Bush	No. Leaves Per Bush	No. Infected Bushes Per Acre	No. Infected Leaves Per Acre	Expo-sure	Soil Moisture Content	Amount Associated Vegetative Cover (Percent)	Light Intensity (Percent Full Sunlight)
Low Thinnings or Thinning from Below																						
A									Acre		2.0	2.9	3.6									
St. Joe N.F.[a]	Light	1936	50	Unknown		1.0	8	11.3	Bush		.25	.36	.45	19.8	2.48	27	6	117	NW	Moderate	34	55
C									Acre		1.6	1.4	1.7									
St. Joe N.F.	Check	1936	50	Unknown		1.0	6	7.5	Bush		.27	.23	.28	12.3	2.05	16	1	2	NW	Moderate	23	35
37									Acre	3.0	3.6	4.6	5.8									
D.C.E.S.[b]	Heavy	1935	45	5,800	420	.72	4	9.9	Bush	.75	.90	1.15	1.45	26.9	6.73	109	3	47	E	Moderate	22	70
37									Acre	21.9	24.3	24.3	22.1									
D.C.E.S.	Light	1935	45	5,800	860	.72	22	113.7	Bush	1.00	1.10	1.10	1.00	206.3	9.38	69	8	29	E	Moderate	21	40
37									Acre	5.2	6.3	6.4	6.1									
D.C.E.S.	Check	1935	45	5,800	5,800	1.44	31	54.8	Bush	.68	.83	.83	.79	78.8	2.54	13	4	16	E	Moderate	18	15
Crown Thinnings or Thinning from Above																						
37									Acre	25.0	21.9	21.6	20.0									
D.C.E.S.	Heavy	1935	45	5,800	4,510	.72	26	134.8	Bush	.96	.84	.83	.77	223.3	8.59	59	14	101	E	Moderate	23	45
37									Acre	19.2	20.4	19.9	20.7									
D.C.E.S.	Light	1935	45	5,800	4,730	.72	19	154.1	Bush	1.01	1.07	1.05	1.09	234.3	12.3	90	18	318	E	Moderate	29	25
37									Acre	7.8	7.5	8.0	7.1									
D.C.E.S.	Check	1935	45	5,800	5,800	1.44	15	49.0	Bush	.52	.50	.53	.47	79.4	5.29	29	9	35	E	Moderate	21	40
46									Acre	1.9	2.5	3.5	3.5									
D.C.E.S.	Light	1935	60	2,460	2,080	.4	8	14.3	Bush	.25	.31	.44	.44	23.8	2.98	11			N	Moderate	18	30
48									Acre	1.1	1.6	2.3	3.2									
D.C.E.S.	Heavy	1935	60	2,460	1,720	.4	5	6.7	Bush	.28	.32	.46	.64	13.8	2.76	21			N	Moderate	26	65
47-59									Acre	3.2	3.5	3.3	3.0									
D.C.E.S.	Check	1935	60	2,460	2.248	.8	14	25.1	Bush	.22	.25	.24	.21	34.9	2.49	11	5	8	N	Moderate	9	10

[a]St. Joe N.F.- Catspur, Clarkia, Idaho, St. Joe National Forest
[b]D.C.E.S.- Deception Creek Experimental Station, Coeur d'Alene National Forest

TABLE NO. 4

EFFECT OF THINNING IMMATURE STANDS ON THE GROWTH AND REGENERATION OF UPLAND RIBES SEEDLINGS

Plot No. and Location	Degree of Thinning	Year Plot Established	Age of Stand When Treated	Stand Density (Trees Per Acre)		Acreage Checked	Ribes Species	Number Seedlings and Amount Live Stem Per Acre Each Year After Treatment										Accumulative Number Ribes Seedlings and Amount Live Stem Per Acre Each Year After Treatment										F.L.S. Per Seedling	No. Leaves Per Seedling	No. Infected Seedlings Per Acre	No. Infected Leaves Per Acre	Exposure	Soil Moisture Content	Amount Associated Vegetative Cover (Percent)	Light Intensity (Percent Full Sunlight)
				Before Treatment	After Treatment			1934		1935		1936		1937		1938		1934		1935		1936		1937		1938									
								No.	F.L.S.	No.	F.L.S.	No.	F.L.S.	No.	F.L.S.	No.	F.L.S.	No.	F.L.S.	No.	F.L.S.	No.	F.L.S.	No.	F.L.S.	No.	F.L.S.								
Low Thinnings or Thinning from Below																																			
26 D.C.E.S.[a]	Heavy	1933	60-65	1,700	268	.25	Ribes lacustre			12	4.1			8	.9					12	4.1	12	10.7	20	15.3	20	19.8	.99	43	4	4	S	Low	45	60
27,28 D.C.E.S.	Light	1933	60-65	1,700	462	.50	Ribes lacustre					2	.6	6	1.3							2	.6	8	2.5	8	3.6	.45	12			S	Low	29	45
29 D.C.E.S.	Light	1933	60-66	1,700	436	.25	Ribes lacustre	4	1.1			32	7.0	252	28.1	12	.8	4	1.1	4	1.7	36	9.2	288	42.4	300	78.9	.26	8	8	12	E	Moderate	20	35
30 D.C.E.S.	Heavy	1933	60-65	1,700	236	.25	Ribes lacustre			20	6.5	44	13.3	384	54.0	28	1.8			20	6.5	64	25.4	448	97.3	476	165.2	.35	9	4	12	E	Moderate	22	50
Area No. 1 D.C.E.S.	Light	1933	50-65	1,550	415	.54	Ribes lacustre			19	8.1	81	19.4	167	13.1	7	.4			19	8.1	100	38.0	267	100.3	274	166.1	.61	14	13	70	S&E	Moderate	33	40
16,17 D.C.E.S.	Check	1933	60-66	1,700		.50	Ribes lacustre					2	.4	66	4.2	46	2.5					2	.4	68	5.1	114	14.1	.12	5	2	6	E	Low	3	15
37 D.C.E.S.	Heavy	1934	45	5,800	420	.72	Ribes lacustre	3	.9	1	.2	1	.2	10	1.7			3	.9	4	1.6	5	2.9	15	6.2	16	11.5	.77	14	5	26	SE	Moderate	22	70
37 D.C.E.S.	Light	1934	46	5,800	860	.72	Ribes lacustre																									SE	Moderate	21	40
37 D.C.E.S.	Check	1934	45	5,800		2.88	Ribes lacustre							1	.1	1	.1							1	.1	2	.2	.10	3			SE	Moderate	18	15
A St. Joe N.F.[b]	Light	1936	50	Unknown		1.0	Ribes lacustre							60	4.6	75	5.5							50	4.6	135	16.1	.12	4	37	90	NW	Moderate	34	55
B St. Joe N.F.	Light	1936	50	Unknown		1.0	Ribes lacustre																									S	Low	64	80
C St. Joe N.F.	Check	1936	50	Unknown		1.0	Ribes lacustre							1	.1									1	.1	1	.2	.22	7			NW	Moderate	23	35
38 Coeur d'Alene N.F.[c]	Light	1934	30-35	2,500	455	.25	Ribes viscosissimum			4	.17	160	7.8	20	1.3					4	.17	164	8.2	184	20.7	184	35.2	.19	4			E	Low	19	65
40 Coeur d'Alene N.F.	Heavy	1934	30-35	2,500	496	.25	Ribes viscosissimum			100	5.2	108	10.6	4	.2					100	5.2	208	28.4	212	52.2	212	74.3	.35	5			E	Low	32	85
39.41 Coeur d'Alene N.F.	Check	1934	30-35	2,500		.50	Ribes viscosissimum																									E	Moderate	7	30
157,158,159 P.R.E.S.[d]	Light	1933	75	1,100	530	.75	Ribes lacustre			1	.12	4	.7							1	.12	5	.87	5	1.64	5	2.46	.49	5			E	Moderate	12	35
160 P.R.E.S.	Heavy	1933	75	1.100	224	.25	Ribes lacustre	4	1.7	4	.2							4	1.7	8	3.2	8	4.9	8	6.0	8	6.73	.84	17			E	Moderate	16	60
161 P.R.E.S.	Check	1934	75	1,100		.25	Ribes lacustre							12	.97									12	.97	12	1.93	.15	6			E	Moderate	5	15
Crown Thinnings or Thinning from Above																																			
46 D.C.E.S.	Light	1935	60	2,460	2,080	.40	Ribes lacustre			3	1.4	5	2.8	3	.4	3	.2			3	1.4	8	5.4	11	9.3	14	11.6	.83	7			N	Moderete	18	30
48 D.C.E.S.	Heavy	1935	60	2,460	1,720	.40	Ribes lacustre			3	1.3	8	1.7	296	14.5	18	.6			3	1.3	11	4.9	306	22.8	324	52.9	.16	7	10	10	N	Low	26	65
47,59 D.C.E.S.	Check	1935	60	2.460	2,248	.80	Ribes lacustre			2	.4									2	.4	2	.6	2	.6	2	.7	.35	4			N	Moderate	9	10
Area No. 10 D.C.E.S.	Light	1935	60	2,460	1,900	2.2	Ribes lacustre			1	.5	102	6.7	243	15.5	26	1.3			1	.5	103	6.9	346	34.9	372	67.5	.18	7	10	72	N	Moderate	17	45
Area No. 10 D.C.E.S.	Fire Lanes	1935	60	2.460		.34	Ribes lacustre					26	3.9	1474	171.4	312	23.9					26	3.9	1500	183.3	1812	557.7	.31	11	94	526	N	Moderate	83	90
37 D.C.E.S.	Heavy	1934	46	6,800	4,610	.72	Ribes lacustre							32	2.2	3	.1							32	2.2	35	3.9	.11	6			E	Moderate	23	45
37 D.C.E.S.	Light	1934	45	5,800	4.730	.72	Ribes lacustre					1	.1									1	.1	1	.4	1	.6	.60	3			E	Moderate	29	25

[a] D.C.E.S.- Deception Creek Experimental Station. Coeur d'Alene National Forest
[b] St. Joe N.F.- Catspur, Clarkia. Idaho, St. Joe National Forest
[c] Coeur d'Alene N.F.- Fourth of July Canyon, Coeur d'Alene National Forest
[d] P.R.E.S.- Priest River Experimental Station, Kaniksu National Forest

[illegible]

[illegible]

[illegible]

Definition: [illegible]

[illegible]

[illegible]

Shelterwood area [illegible] white pine [illegible] stand was composed of [illegible] 1936 by [illegible] felled [illegible] This area was [illegible] area are shown in photographs Nos. [illegible]

Pre-logging area [illegible] 250-300 year old stand of white pine growing on a [illegible] and white fir were felled [illegible]

[illegible]

[illegible] area No. [illegible] - A mature [illegible] year old [illegible] on a [illegible] slope. [illegible] were disposed of as described for area No. [illegible]. [illegible] in 1925. The slash was disposed [illegible] of 1926. [illegible] were removed previous to the treatment. [illegible] the same numbers and in identical sites in [illegible] area [illegible] shown in [illegible].

[illegible] area No. 9 - A mature 161-200 year old stand [illegible] white [illegible] adjacent to area No. [illegible]. In the fall [illegible] white fir and [illegible] fir over [illegible] inches d.b.h. were girdled. [illegible] were completed in [illegible] of 1926. At this time trees under [illegible] felled and [illegible] lopped and piled for burning [illegible] piles of slash per acre which were burned [illegible] 1926. [illegible] about 15 beetles per acre were removed [illegible] No. 9 [illegible].

[illegible] area No. 11 - A mature 161-200 year old stand [illegible] in 1914-1915 [illegible] private ownership. The [illegible] felled and broadcast burned in 1926. [illegible] to the 1926 treatment and had resulted in [illegible] approximately [illegible] per acre.

[illegible] area No. 14 - A mature 121-160 year old stand [illegible] the residual hemlock and white fir [illegible] in 1926 [illegible] to 1927. During control work prior to the 1926 [illegible] approximately [illegible] per acre had been removed.

[illegible] Wilderness Area:

[illegible] area - A mature 161 plus year old stand [illegible] white pine, [illegible] white fir, hemlock and Douglas fir. The [illegible] percentage of the [illegible] species were removed by felling [illegible] conditions favorable for the establishment of the [illegible] which was piled and progressively burned during the fall and [illegible] 1925 and 1926. [illegible] measures were applied previous to the [illegible] this area and approximately six D. lacustre were removed per acre.

[illegible] Partial Cut Area - An early maturing 80 year old [illegible] of fast growing white pine which made up 90 percent of the [illegible] of [illegible] board feet per acre. The remainder of the stand was composed of Douglas fir, [illegible] pine and cedar. A partial cut was made [illegible] removing 60 percent of the total volume or 72 percent of the volume of [illegible] in 1927. The slash was piled and progressively burned in small piles. [illegible] D. lacustre per acre were removed from this area before the logging.

W 2482, 2483. Deception Creek Experiment Station, Shelterwood Area No 12. Alternate strips of clear cutting, slash broadcast burned, combined with shelterwood cutting, slash piled and burned, north exposure. Undesirable trees felled to create residual shelterwood of white pine seed trees. Medium broadcast burn responsible for two and one-fourth more ribes. Note general heavy vegetative cover on broadcast area contrasted to spotty cover in shelterwood

W 2485. Deception Creek Experiment Station, Area No. 6. Pre-logging disposal of undesirable trees by felling, slash piled and burned, south exposure. Note scarcity of vegetative cover. Conditions slightly favorable for ribes in spots.

W 2484 Deception Creek Experiment Station, Area No 8. Same type of treatment as described under W 2485 to create shelterwood conditions favorable for establishment of white pine reproduction in advance of logging. Note general vegetative cover and conditions favoring the germination and survival of ribes seedlings on north exposure.

[illegible]

[illegible]

[illegible]

TABLE NO. 5

EFFECT OF MATURE STAND IMPROVEMENT ON THE GROWTH AND REGENERATION OF RIBES LACUSTRE

Plot No. and Location	Slash Disposal	Year Plot Estab-lished	Acreage Checked	Number Seedlings and Amount Live Stem Per Acre Each Year After Treatment								Accumulative Number Seedlings and Amount Live Stem Per Acre Each Year After Treatment								F.L.S. Per Seedling	No. Leaves Per Seedling	No. Infected Seedlings Per Acre	No. Infected Leaves Per Acre	Expo-sure	Soil Moisture Content	Amount Associated Vegetative Cover (Percent)	Light Intensity (Percent Full Sunlight)
				1935		1936		1937		1938		1935		1936		1937		1938									
				No.	F.L.S.	No.	F.L.S.	No.	F.L.S.	No.	F.L.S.	No.	F.L.S.	No.	F.L.S.	No.	F.L.S.	No.	F.L.S.								
Shelterwood and Clear-cutting in Alternate Strips																											
Area No. 12 D.C.E.S.[a]	Shelterwood, slash piled and burned, 1936	1935	1.5	1	1.2	3	2.7	161	57.3	89	16.1	1	1.2	4	5.2	165	68.1	254	175.4	.69	25	12	57	N	Moderate	26	60
Area No. 12 D.C.E.S.	Clear-cut, slash broadcast burned, 1936	1935	2.0	2	.6	30	23.7	192	267.9	398	177.4	2	.6	32	25.3	224	325.1	622	938.0	1.51	37	137	915	N	Moderate	31	95
Pre-logging Disposal Measures																											
Area No. 6 D.C.E.S.	Felling, slash piled and burned, 1936	1936	1.4			3	.5	68	14.5	111	8.6			3	.5	71	16.0	182	57.1	.34	11	3	5	S	Low	19	40
Area No. 8 D.C.E.S.	Felling, slash piled and burned, 1936	1935	1.5	8	26.6	72	81.1	258	65.8	833	107.4	8	26.6	80	1,116.3	338	333.4	1,171	691.2	.59	15	67	244	N	Moderate	26	35
Area No. 9 D.C.E.S.	Girdling and felling, slash piled and burned, 1936	1935	1.2			1	.1	28	7.8	82	8.9			1	.1	29	8.0	111	28.9	.26	10	6	44	N	Moderate	14	25
Hannah Area Kaniksu N.F.	Felling, slash piled and burned, 1935-1936	1935	2.0			1	.2	3	.3					1	.2	4	.8	4	1.9	.48	42			N	Low	25	55
Complete Disposal - Clear-cut																											
Area No. 11 D.C.E.S.	Slash broadcast burned, 1936	1936	1.3			1	.4	2	2.0	2	1.2			1	.4	3	2.9	5	7.2	1.44	26			S	Low	17	95
Area No. 14 D.C.E.S.	Slash broadcast burned, 1937	1936	1.7																					W	Low	3	95
Partial Cut - White Pine																											
Bear Paw Area Kaniksu N.F.	Slash piled and burned, 1937	1937	3.0							3	.3							3	.3	.1	9			N	Moderate	32	25

[a]D.C.E.S.- Deception Creek Experimental Station, Coeur d'Alene National Forest

[illegible] strips extending toward the [illegible] seedlings were found [illegible] wood strips. The degree of [illegible] has been destroyed. The [illegible] of germination [illegible] both the shelterwood strips and the [illegible] five chain [illegible] of these [illegible] moist conditions of the [illegible] delayed [illegible] seedlings. Since this [illegible] upland conditions [illegible] germination has not been [illegible]

Changed environmental conditions strongly [illegible] development of [illegible] Approximately [illegible] percent of the [illegible] area as compared with [illegible] vegetation. The shelterwood [illegible] whereas on the complete [illegible]

These two types of cutting will not [illegible] effective [illegible] measures [illegible] the shelterwood. The [illegible] remove [illegible] seedlings appearing after [illegible] a relatively [illegible] wood strips [illegible] the germination [illegible] wood, skidding of [illegible] complete diagonal area. This recommendation [illegible] practically complete [illegible] areas.

Four areas were available in which partial [illegible] in advance of logging [illegible] regeneration of [illegible] seedlings. Areas No. [illegible] of treatment applied [illegible] exposure was found [illegible] seedlings as were [illegible] favored the growth and development of the seedlings. [illegible] largest percentage of [illegible] cut. On area No. 9 the larger [illegible] under 6 inches d.b.h. were [illegible]

[illegible] per acre [illegible] approximate [illegible] development of ribes on this area and [illegible] were well established. The [illegible] area [illegible] seed, has never been a ribes problem. In such areas disturbance will [illegible] bearing on eradication work.

Two operations are necessary to complete pre-logging disposal [illegible] in advance of logging in mature stands. The first is the removal [illegible] species or the source of unwanted seed in advance of logging; and [illegible] the actual logging of the residual stand. In connection with the [illegible] girdling has proved highly satisfactory toward the discouragement of [illegible] germination, having caused only about one tenth the number of [illegible] were caused by the complete felling of unmerchantable trees. [illegible] second operation, the removal of the merchantable residual stand, [illegible] to be little opportunity to discourage the germination of ribes seed [illegible] from the mechanical disturbance necessary to remove the logs; [illegible] however, may be materially reduced if the slash is not burned. [illegible] can be satisfactorily established before or shortly after the logging [illegible] areas, ribes seedlings that do appear should rapidly and progressively [illegible] because of severe competition from the young developing forest.

Two areas are being studied on which the complete disposal [illegible] been applied under experimental management. A heavy burn was obtained [illegible] areas although it was evident that area No. 11 had not been as [illegible] as area No. 14. In either case practically all the organic mantle had [illegible] consumed. A total of only five ribes seedlings per acre was found [illegible] No. 11. It seems apparent that the mortality of ribes seedlings [illegible] not only by heavy shade but by the dryness of exposed sites such as would [illegible] produced by complete disposal measures on south slopes. The results [illegible] studies have also shown that complete disposal measures properly [illegible] destroy a large portion of the stored ribes seed on the [illegible] If ribes seedlings do appear and are removed before the seeding [illegible] anew on the complete disposal areas it is very unlikely such ground [illegible] become reinhabited by ribes.

The Bear Paw area, while not exactly catalogued as a stand [illegible] approaches logging perfection by materially assisting in ribes suppression [illegible] original stand volume of this area was 29,906 board feet per acre. [illegible] white pine partial cut removed 28 percent of this volume, the remaining [illegible] well stocked and casts a heavy ground shade. It is very unlikely [illegible] conditions beneath this canopy will ever encourage the development [illegible] only three *R. lacustre* seedlings were found the first year following logging. With a number of cutting cycles possible in this fast growing stand of [illegible] pine, ribes regeneration should not become serious until the final and [illegible] removal cut and even then established reproduction may strongly inhibit [illegible] development.

[illegible]

There are two fundamental [illegible] if the [illegible] The first objective is to [illegible] is [illegible] excessive [illegible] The second objective [illegible] number of seedlings [illegible] obtained by maintaining [illegible]

[illegible] tilled seedlings. [illegible] the peak of germination [illegible] in [illegible]

[illegible] seedlings. [illegible] seedlings [illegible] disease. [illegible] these seedlings. [illegible] seedlings.

[illegible] there [illegible] [illegible]
[illegible]
[illegible]
[illegible]
[illegible] where the larger [illegible]
[illegible] original [illegible]
seedlings. Any type of [illegible]
before the removal of the merchantable residual stand in order to [illegible]
to the developing white pine reproduction. There are [illegible]
contain but few [illegible]
materially affect the control program. In mature stands [illegible]
materially aided by stand improvement practices if as [illegible]
as possible is maintained on the area. Before the residual [illegible]
stocking of reproduction should [illegible]
removal cut in order to [illegible]

REFERENCES

(1) Davis, Kenneth P.

Stand Improvement Measures for the Western White Pine Type
U.S.D.A. Forest Service, Region One, September [illegible]

(2) Haig, Irvine T., Davis, Kenneth P., and Weidman, Robert H.

Natural Regeneration in the Western White Pine Type
Manuscript now in the process of publication as a U. S. Department of
Agriculture Technical Bulletin.

[illegible]

[illegible]

INTRODUCTION

The greater part of the 1939 season was spent on [illegible] to determine what [illegible] stand improvement [illegible] type would have upon the growth and regeneration of ribes. [illegible] not in the nature of direct studies of current eradication [illegible] findings will be valuable in the solution of general control [illegible] studies that in addition to the current eradication problem [illegible] time as was not required for the major project. The following [illegible] of these investigations and the results obtained.

Effect of Redisturbance of Old Cut-Over Areas

This study was established in 1933 by Dr. [illegible] what effect the redisturbance of ground conditions on [illegible] would have upon the regeneration of ribes and pines. It was assumed [illegible] ging disturbance and the burning of slash [illegible] ribes seed or caused their complete germination. [illegible] removed from the vicinity of this area until 1933. The area [illegible] experiment was cleared of all brush and forest debris. [illegible] and burned on the site resulting in complete duff burning [illegible] the area. Those portions that remained unburned were [illegible] that the entire area was disturbed in the manner of [illegible] first three [illegible] of this area are presented in Table I.

This study clearly indicates that any operation [illegible] redisturbance of the forest floor after the initial logging will [illegible] favorable for the germination and development of ribes seedlings. [illegible] peak of germination for both pine and ribes, as indicated by [illegible] occurred the second year following the disturbance. It is [illegible] germination of both pine and ribes seed is complete [illegible] the disturbance.

TABLE NO. 1

[illegible]
[illegible] PLOT AND [illegible] SEED

Plot Area and Year Sown	Kind of Seedlings	Number of Seedlings and Amount of [illegible] Live [illegible] Per Acre Developing Each Year After Treatment										Exposure	Moisture Conditions	Vegetative Cover Per Cent	[illegible]
		[illegible]		1935		1936		1937		[illegible]					
		No.	[illegible]	No.	[illegible]	No.	[illegible]	No.	[illegible]	No.	[illegible]				
		Annual Readings [illegible]													
[illegible]	[illegible]			17	8.4	[illegible]	[illegible]	[illegible]	[illegible]			[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]		[illegible]		[illegible]		[illegible]							
		Accumulative Readings [illegible]													
	[illegible]			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]				
	[illegible]	[illegible]		[illegible]		[illegible]		[illegible]		[illegible]					

[illegible]

Two conditions known to be largely detrimental to [illegible] ribes are the extremely open and dry forest sites commonly resulting from complete stand disposal measures on exposed slopes and the [illegible] under residual stands left after partial cutting. To accurately [illegible] comparative rates of seedling mortality relative to the various types of cutting on the different exposures a study was started in [illegible]. A series of permanent plots will be established on newly logged areas [illegible] the western white pine type. These areas will be inspected annually [illegible] the development of ribes seedlings. The results presented [illegible] current mortality of plots established to date which are in a [illegible] cut area.

The results indicate that during the summer period of [illegible] months heavy losses are encountered in newly germinated seedlings [illegible] exposed sites in cuttings of this type. A greater number of seedlings [illegible] on the more favorable slopes was less affected during the current [illegible]. It seems evident that higher soil temperatures are usually required [illegible] sites for the seed of *Ribes lacustre* to germinate than for [illegible]. It was found that the seedlings of *R. lacustre* did not appear until [illegible] date of the first check which was June [illegible]4. Many south slopes [illegible] which *R. lacustre* seldom inhabits. Drought mortality appears to be [illegible] for eliminating approximately one fourth of the ribes seedlings during [illegible] season on the average exposure in areas of this type of cutting.

TABLE NO. [illegible]

[illegible]

[illegible]	Expo- sure	[illegible]	Number Live Seedlings per Sq. Ft. [illegible]		Resulting Mortality [illegible]	Mois- ture Condi- tions	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Medium	19	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Medium	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Light	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Light	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Medium	[illegible]	[illegible]

[illegible]

[illegible] all [illegible] during [illegible] germination and the period [illegible] it was found that [illegible] originate largely in [illegible]. [illegible] of the [illegible] ribes [illegible]. It is very [illegible] be successfully [illegible] should be [illegible] appears to be a [illegible].

Effect of Cattle Trails on [illegible]

A number of areas [illegible] have been employed to eliminate [illegible] ribes and [illegible] from [illegible]. volume of fuel [illegible] destroying [illegible] several such areas showed [illegible] light [illegible]. Even [illegible] conditions strongly [illegible] germination was found to [illegible] evidence pointed to the fact that the ribes [illegible] record. Control measures [illegible] third year to obtain the greatest advantage from [illegible] as possible [illegible] areas should [illegible] removed early in the season of [illegible].

The Effect of Brush [illegible] on Ribes [illegible]

Often it becomes necessary to [illegible] before planting can be successfully [illegible] has been treated by bulldozing [illegible] with planting [illegible] determine the ribes problem [illegible] heavily [illegible] ribes regeneration. The results of a [illegible] showed that the R. viscosissimum seedlings [illegible] and [illegible] burning of slash on the [illegible] extensively employed in brush areas of the [illegible] should be applied between the [illegible] operation. The planting of [illegible] removal of these populations.

[illegible]

Under [illegible] conditions, [illegible] plants [illegible] with only [illegible] slight disturbances such as burning, [illegible] etc. will not materially affect the germination of [illegible]. The rapidity with which a compact [illegible] is formed on the forest floor [illegible] disturbances depends largely upon the type of cutting, [illegible] the extent to which reproduction and subordinate [illegible]. Until such a cover has developed the forest [illegible] types of disturbances which often favor the establishment of [illegible] seedlings. It remains to be [illegible] for each [illegible] will continue to germinate in [illegible] proportions, the [illegible] measures on the status of ribes populations, the [illegible] and the type of cutting that best affords the [illegible] ribes suppression.

Four [illegible] acre plots were established this past season [illegible] types of partial cutting and one in a completely cut stand. All ribes [illegible] removed from these plots after completing the recording of [illegible] data. If new seedlings appear, such will be [illegible] actual development.

Seedling Occurrence in Stream Type

The [illegible] in stream type are [illegible] the persistent occurrence of ribes. When ribes populations have [illegible] broken down [illegible] and fresh seed [illegible] of these areas by ribes [illegible]. There is [illegible] to indicate that the longevity of ribes seed [illegible] is of much shorter duration than for those in the uplands. [illegible] were established last season to determine the how long [illegible] seedlings continue to appear following [illegible]. The results of [illegible] 1957 annual report. Only one additional R. [illegible] origin was found on plot 2 of the Swamp Creek study area. [illegible] plots were observed to have become densely sodded with grass.

One additional 1958 R. [illegible] seedling was found on [illegible] Creek series and one R. lacustre on the Yellow Dog plot. [illegible] type plots showed no further ribes development. This [illegible] that by the third or fourth year succeeding the initial [illegible] concentrations in major stream type, grasses and herbaceous [illegible] established [illegible] a full [illegible] for the establishment of ribes seedlings. This [illegible] in minor stream type, since ribes seedlings [illegible] years following ribes work. [illegible] in minor streams appear to be factors [illegible] causing the stored seed of ribes to germinate. [illegible] vegetation of ribes [illegible] front results a large [illegible] of the stream [illegible] permanently established in major stream type.

[illegible]

by

[illegible]
Assistant Pathologist

A continuous search is being made for new equipment [illegible] the efficiency of ribes eradication work. During the past year [illegible] sprayer and a new grubbing tool, both of which give promise of [illegible] efficiency and reduce costs, have been developed.

[illegible] Sprayer

[illegible] chemical sprayer developed is a light [illegible] suitable for respray work where ribes are scattered. The device, which [illegible] trated in picture # 2375, consists of a four gallon tank fitted with [illegible] to permit mixing within the tank, hand pump to develop the necessary [illegible] and a hose and pipe outlet line leading to the nozzle. A hardwood [illegible] used for carrying the unit. Dry chemical is carried in a sack or [illegible] mixing is done by the operator as the spray is needed. A comparison [illegible] equipment used in the past with the new unit is shown in picture # [illegible]

Among the advantages resulting from use of the new spraying [illegible] a saving in spray and a reduction in spraying time due to the reduced [illegible] amount of equipment necessary. With the new equipment each worker is [illegible] independent and mobile unit.

Remodelled Trench Picks for Upland Ribes Eradication

In 1937 tests of various tools to assist in the removal [illegible] the ground were made and since that time several designs have been [illegible] trench pick, the grub hoe, the mattock and the Pulaski have all been [illegible] efficiency of tools depends on the species of ribes to be taken [illegible] sites and general working conditions.

General interest in an improved trench pick prompted the [illegible] in 1937 of a small pickaxe and alpine staff head which were built [illegible] the field for trial (Picture # 2488). These proved to have only [illegible] limited use. Early in 1946 a WPA laborer rebuilt a trench pick into [illegible] pick similar to a tool designed but only partially tested in 1937. [illegible] newer tool appeared to have possibilities several were constructed [illegible] each operation for thorough test. Based on the results of these [illegible] indicated the need for a few minor changes, a very efficient ribes [illegible] (Picture # 2489). One thousand of these are being constructed for [illegible]

The outstanding advantages of the new tool are (1) the [illegible] with which the prongs can be driven under a ribes bush crown, (2) [illegible] of the claws on large roots, (3) the lifting power of the tool when [illegible] is made on the handle and (4) the efficiency of the claw for pulling [illegible]

W 2380. Equipment use for initial spray work (on the ground) compared with the compoct unit developed for rework

W 2375. The compressed air sproying unit in use

[illegible]

[illegible]

During [illegible] the [illegible] along the same general [illegible] continued in charge of the [illegible] Sugar Pine Regions. The educational activities [illegible] and the services of a full time [illegible] the personnel along with other activities. The following [illegible] of these two projects separately.

A. Photographic Section

The objectives of the photographic section were (1) [illegible] pictorial record of all phases of [illegible] the supervisory field personnel with [illegible] control work, (3) [illegible] reports or [illegible] and (4) to provide the educational [illegible] illustrative material.

During 1939 [illegible] leader [illegible] Snake Mountain [illegible] with [illegible] office reproductions [illegible] special reports. Enlargements [illegible] report and [illegible] enlargements [illegible] slides for the [illegible]

The [illegible] section [illegible] graphic section. [illegible] time to time according [illegible] at a [illegible] proved [illegible] This machine [illegible] lucing [illegible] the most efficient [illegible]

A [illegible] printing machine was [illegible] in the photographic section during the year. This machine [illegible] and black lines [illegible] the processing. [illegible] needs of the field personnel. [illegible] original [illegible] tracings can be made in the machine. The [illegible] experimental and educational [illegible] knowledge of [illegible] indicated [illegible] demand for this type of work during the succeeding years.

[illegible]

[illegible]	[illegible]	[illegible]
Total [illegible]		
Grand [illegible]		

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

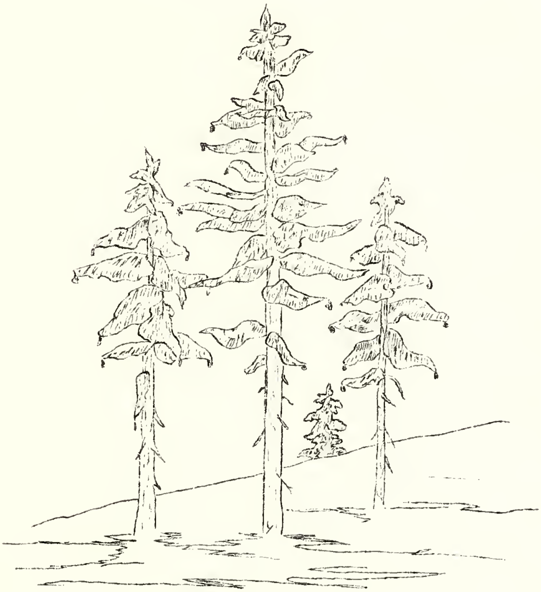
[illegible] throughout the [illegible] [illegible] in these directions. The [illegible] [illegible] [illegible] and the [illegible] [illegible] its control.

REPORT OF BLISTER RUST CONTROL ACTIVITIES

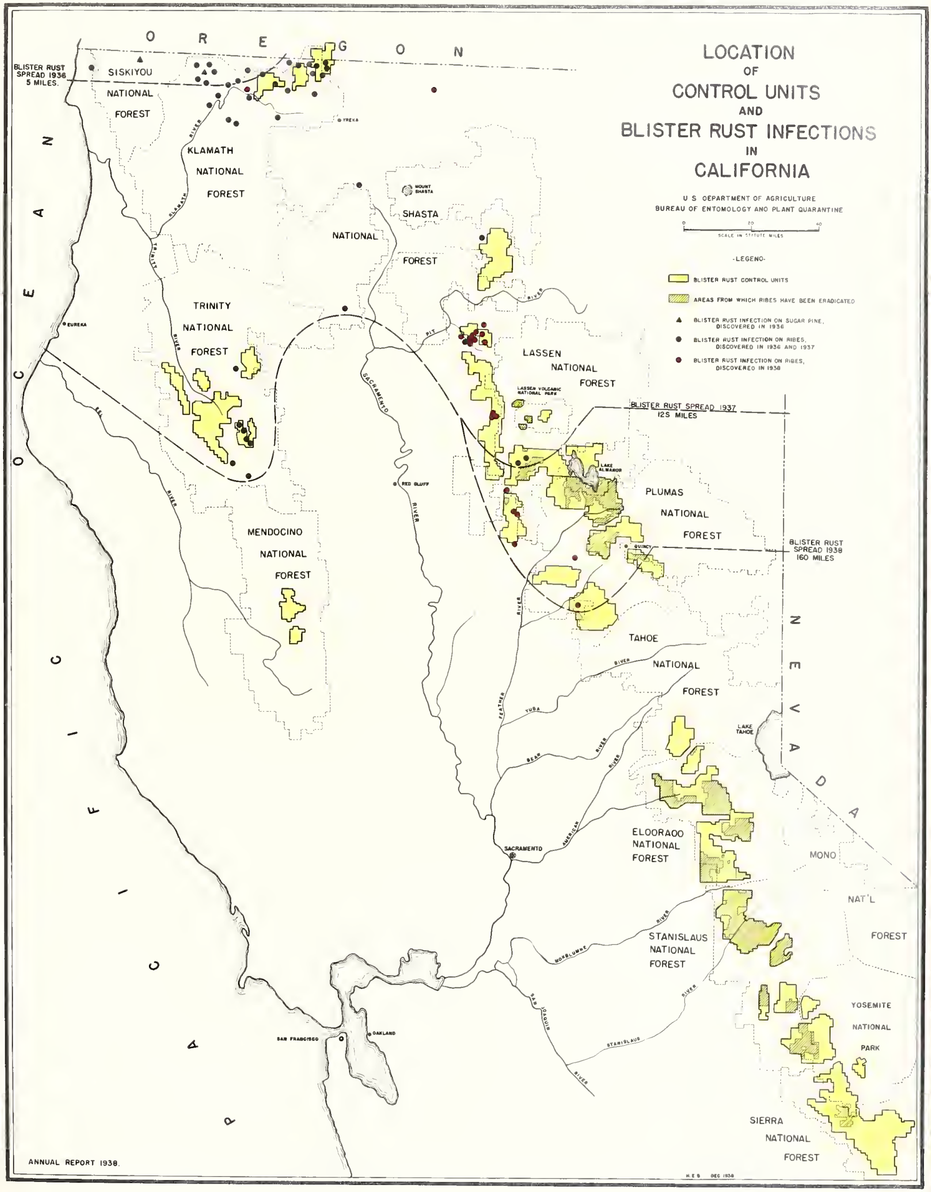
IN THE

SUGAR PINE REGION

1938



Regional Office of the Sugar Pine Region
Division of Plant Disease Control
Bureau of Entomology and Plant Quarantine
United States Department of Agriculture
610 Syndicate Building
Oakland, California



LOCATION
OF
CONTROL UNITS
AND
BLISTER RUST INFECTIONS
IN
CALIFORNIA
U S DEPARTMENT OF AGRICULTURE
BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE
0 20 40
SCALE IN STATUTE MILES
-LEGEND-
BLISTER RUST CONTROL UNITS
AREAS FROM WHICH RIBES HAVE BEEN ERADICATED
BLISTER RUST INFECTION ON SUGAR PINE, DISCOVERED IN 1936
BLISTER RUST INFECTION ON RIBES, DISCOVERED IN 1936 AND 1937
BLISTER RUST INFECTION ON RIBES, DISCOVERED IN 1938
O R E G O N
BLISTER RUST SPREAD 1936 5 MILES.
BLISTER RUST SPREAD 1937 125 MILES
BLISTER RUST SPREAD 1938 160 MILES
SISKIYOU NATIONAL FOREST
KLAMATH NATIONAL FOREST
SHASTA NATIONAL FOREST
TRINITY NATIONAL FOREST
LASSEN NATIONAL FOREST
PLUMAS NATIONAL FOREST
MENDOCINO NATIONAL FOREST
TAHOE NATIONAL FOREST
ELDORADO NATIONAL FOREST
STANISLAUS NATIONAL FOREST
MONO NAT'L FOREST
YOSEMITE NATIONAL PARK
SIERRA NATIONAL FOREST
LASSEN VOLCANIC NATIONAL PARK
MOUNT SHASTA
YREKA
EUREKA
RED BLUFF
QUINCY
LAKE ALMANOR
LAKE TAHOE
SACRAMENTO
SAN FRANCISCO
OAKLAND
N E V A D A
P A C I F I C O C E A N
KLAMATH RIVER
TRINITY RIVER
EEL RIVER
SACRAMENTO RIVER
PIT RIVER
FEATHER RIVER
YUBA RIVER
BEAR RIVER
AMERICAN RIVER
MOKELUMNE RIVER
SAN JOAQUIN RIVER
STANISLAUS RIVER
ANNUAL REPORT 1938.
H E B DEC 1938

TABLE OF CONTENTS

BLISTER RUST CONTROL IN THE SUGAR PINE REGION, 1938

PART I - GENERAL

By

Warren V. Benedict, Senior Forester

INTRODUCTION

In 1938 three governmental agencies in the Sugar Pine Region, which consists of the states of Oregon and California, engaged in blister rust control. They were the Forest Service and the Bureau of Entomology and Plant Quarantine of the United States Department of Agriculture, and the National Park Service of the United States Department of the Interior. Ribes were eradicated from control units in six national forests and three national parks. The Park Service initiated Ribes eradication on Lassen Volcanic and General Grant National Parks and continued control work on Yosemite National Park with CCC enrollees. The Forest Service operated an ERA, a CCC, and a regular fund program, and the Bureau an ERA program on the national forests on which control work had been done previously. These operations resulted in the initial removal of Ribes from 69,379 acres, the second working of 38,303 acres, the third working of 1,126 acres, and the fourth working of 745 acres, making a total coverage of 109,553 acres. The number of Ribes eradicated was 23,093,653.

Several special blister rust surveys, designed to gather information on Ribes populations, the distribution of white pine types, and on general eradication problems were undertaken on several control units, both provisional and established. One of these the Forest Service financed on the Forest Hill Divide unit of the Tahoe National Forest; 16,231 acres were examined. In the High Sierra of Yosemite National Park, 20,630 acres of western white and white bark pines, and in Sequoia National Park, 36,210 acres of sugar pine type were advanced checked. The Yosemite job was financed by the Park Service, and the Sequoia job jointly by the Park Service and the Bureau of Entomology and Plant Quarantine. Technical supervision of all three jobs was furnished by the Bureau. After lapsing into oblivion for thirty years, a rare species of Ribes, R. tularense, closely related to R. binominatum was again located in Sequoia Park by men of the Bureau. So far as known the range of this species is confined to 2,418 acres in the Park; the distribution there was carefully determined in the course of the blister rust survey.

Several notable discoveries of the spread of the rust were brought to light as a result of scouting work. In the vicinity of Terry Mill and the north and south forks of Montgomery Creek between the Shasta and Lassen National Forests a comparatively large infection of blister rust on R. roezli and R. nevadense was found. About 300 infected bushes were examined, which represented a density of diseased bushes of about one in ten. A careful search disclosed no diseased sugar pines. Another large Ribes infection was discovered at Viola on the Lassen National Forest, and six small ones in the southern part of the forest. A Ribes infection at Buck's Lake and one at Cascade established the presence of blister rust

for the first time on the Plumas National Forest and moved the known occurrence of the disease 40 miles farther south, which places the disease 160 miles south of the California-Oregon state line.

ORGANIZATION AND ADMINISTRATION

During 1938 the National Park Service, the U. S. Forest Service, and several agencies of the states of Oregon and California undertook blister rust control work on a cooperative basis with the Bureau of Entomology and Plant Quarantine. Cooperative agreements between these organizations and the Bureau outlined the character of the cooperation and defined the policies that guided the work. The memorandum of agreement with the Forest Service drawn up on May 26, 1937 remained in effect unchanged during 1938; a copy of it appears in the annual report of the Sugar Pine Region for 1937. A memorandum issued by the Regional Director of Region IV of the National Park Service to the National Park Superintendents under date of April 27, 1938 defines the cooperative relations between the Park Service and the Bureau of Entomology and Plant Quarantine and the extent of responsibility of each agency. A copy of this memorandum and of the renewals of the memoranda of agreements between the Bureau and the several state agencies will be found at the end of Part I.

The organization of blister rust control activities and of the permanent personnel in the Sugar Pine Region are illustrated in the accompanying organization chart. The relation obtaining among the different departments and the lines of responsibility of personnel may be seen from an examination of the chart. Not included in the chart is the Berkeley, California office handling developmental work in control methods; it is organized as an independent unit as follows:

Developmental Work in Control Methods:

H. R. Offord, Pathologist, in charge.
C. R. Quick, Assistant Pathologist.
Lawrence P. Winslow, Agent.
Catherine Ryan, Jr. Clerk-Stenographer.

The Forest Service maintained the following staff officers charged with blister rust control on their respective national forests:

Ralph A. James, Assistant Forester, Plumas National Forest.
Eugene H. Kincaid, Agent, Eldorado National Forest.
Charles E. M. Carlson, Jr. Range Examiner, Stanislaus National Forest.
Arthur London, Assistant Forester, Sierra National Forest.

As has been the case each year since 1935, the 1938 season was financed principally by allotments of funds from the current Emergency Relief Appropriation Acts, and consequently most of the activities of this Region were subject to the rules and regulations governing employment of labor and limitation of expenditures as set forth by the Works Progress Administration. The major portion of the comparatively small

allotment of regular funds was used to pay the salaries of regular personnel. Most of the remaining balance was used to finance a Ribes eradication job on two small plots on the Shasta National Forest for experimental studies by the Office of Forest Pathology, a small amount of checking in the Region, a scouting project in California, and to assist in financing a special survey on the Sequoia National Park in cooperation with the National Park Service. Table 1 shows the amount expended by the Sugar Pine Regional office during the calendar year 1938 by appropriation symbol and project, classified into six major objects of expenditure.

In addition to the work financed by funds disbursed through the Sugar Pine Regional Office, the Forest Service financed considerable eradication work in California on Federal land through the expenditure of their regular and emergency allotments and by the assignment of several CCC camps to blister rust control work. In Oregon the Forest Service assisted the Bureau work on the Rogue River National Forest by furnishing pack stock for one of the Bureau camps and by cooperating in other ways. The National Park Service assisted in financing two reconnaissance parties in California, one on the Sequoia National Park and one on Yosemite National Park, for the purpose of obtaining information as to size, priority, and cost of control programs on these National Parks. Reports of these accomplishments appear later in the text.

For the entire year the Forest Service reimbursed the Bureau for the salaries and expenses of checking supervisors S. D. Adams, Agent, and J. N. Mitchell, Assistant Forester, in payment of checking work on national forest lands, and of Eugene H. Kincaid, Agent, who acted as Forest Service staff officer on the Eldorado Forest.

Memorandum of Agreement

between the

Bureau of Entomology and Plant Quarantine

and

Oregon

1. Oregon State Board of Forestry, Salem, Oregon

2. Bureau of Plant Industry, Oregon State Department of Agriculture, Salem, Oregon

California

1. Division of Forestry, California Department of Natural Resources, Sacramento, California

2. California Department of Agriculture, Sacramento, California

3. College of Agriculture, University of California, Berkeley, California

4. Botanical Garden, University of California, Berkeley, California

5. Department of Botany, University of California, Berkeley, California

****

National Park Service - (Memorandum to National Park Superintendents, April 27, 1938)

October 28, 1938

State Forester J.W. Ferguson, Jr.,
Oregon State Board of Forestry,
Salem, Oregon.

Dear Mr. Ferguson:

Reference is made to Mr. Hoyt's letter to you of June 30, 1938, confirming the renewal of the Memorandum of Agreement between this Bureau and the Oregon State Board of Forestry, and the Bureau of Plant Industry, Oregon State Department of Agriculture relative to co-operative work in controlling white pine blister rust for the fiscal year beginning July 1, 1938. The information as to the funds to be expended under this Memorandum of Agreement is now available.

It is agreed that the expenditures for this work during the fiscal year beginning July 1, 1938, shall be approximately $7,200 by the Bureau of Entomology and Plant Quarantine, and a total of approximately $500, including services, by the State agencies named. If this meets with your approval, will you please so indicate by signing and returning the carbon copy of this letter, retaining the other copy for your files.

Very truly yours,

/s/ Lee A. Strong,

Chief of Bureau.

Concurred in:

/s/ J. W. Ferguson, Jr.
State Forester, Oregon State Board of Forestry.

October 28, 1938

Director Frank McKennon,
Bureau of Plant Industry,
Oregon State Department of Agriculture,
Salem, Oregon.

Dear Director McKennon:

Reference is made to Mr. Hoyt's letter to you of June 30, 1938, confirming the renewal of the Memorandum of Agreement between this Bureau and the Bureau of Plant Industry, Oregon State Department of Agriculture, and the Oregon State Board of Forestry relative to cooperative work in controlling white pine blister rust for the fiscal year beginning July 1, 1938. The information as to the funds to be expended under this Memorandum of Agreement is now available.

It is agreed that the expenditures for this work during the fiscal year beginning July 1, 1938, shall be approximately $7,200 by the Bureau of Entomology and Plant Quarantine, and a total of approximately $500, including services, by the State agencies named. If this meets with your approval, will you please so indicate by signing and returning the carbon copy of this letter, retaining the other copy for your files.

Very truly yours,

/s/ Lee A. Strong,

Chief of Bureau.

Concurred in:

/s/ Frank McKennon
Director, Bureau of Plant Industry,
Oregon State Department of Agriculture.

October 28, 1938

State Forester M. B. Pratt,
Division of Forestry,
California Department of Natural Resources,
Sacramento, California.

Dear Mr. Pratt:

Reference is made to Mr. Hoyt's letter to you of June 28, 1938, confirming the renewal of the Memorandum of Agreement between this Bureau and the Division of Forestry of the California State Department of Natural Resources, the California State Department of Agriculture, and the College of Agriculture, Department of Botany, and Botanical Garden, University of California relative to cooperative work in controlling white pine blister rust for the fiscal year beginning July 1, 1938. The information as to the funds to be expended under this Memorandum of Agreement is now available.

It is agreed that the expenditures for this work during the fiscal year beginning July 1, 1938, shall be approximately $36,800 by the Bureau of Entomology and Plant Quarantine, and a total of approximately $10,500, including services, by the State agencies named. If this meets with your approval, will you please so indicate by signing and returning the carbon copy of this letter, retaining the other copy for your files.

Very truly yours,

/s/ Lee A. Strong,

Chief of Bureau.

Concurred in:

/s/ M. B. Pratt
State Forester, Division of Forestry,
California Department of Natural Resources.

October 28, 1938

Director A. A. Brock,
California Department of Agriculture,
Sacramento, California.

Dear Director Brock:

Reference is made to Mr. Hoyt's letter to you of June 28, 1938, confirming the renewal of the Memorandum of Agreement between this Bureau and the Division of Forestry of the California State Department of Natural Resources, the California State Department of Agriculture, and the College of Agriculture, Department of Botany, and Botanical Garden, University of California relative to cooperative work in controlling white pine blister rust for the fiscal year beginning July 1, 1938. The information as to the funds to be expended under this Memorandum of Agreement is now available.

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Very truly yours,

/s/ Lee A. Strong,

Chief of Bureau.

Concurred in:

/s/ A. A. Brock
Director, California Department of Agriculture.

October 28, 1938

Dean C. B. Hutchison,
College of Agriculture,
University of California,
Berkeley, California.

Dear Dean Hutchison:

Reference is made to Mr. Hoyt's letter to you of June 28, 1938, confirming the renewal of the Memorandum of Agreement between this Bureau and the Division of Forestry of the California State Department of Natural Resources, the California State Department of Agriculture, and the College of Agriculture, Department of Botany, and Botanical Garden, University of California relative to cooperative work in controlling white pine blister rust for the fiscal year beginning July 1, 1938. The information as to the funds to be expended under this Memorandum of Agreement is now available.

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Very truly yours,

/s/ Lee A. Strong,

Chief of Bureau.

Concurred in:

/s/ C. B. Hutchison
Dean, College of Agriculture,
University of California.

October 28, 1938

Dr. T. H. Goodspeed,
Director, Botanical Garden,
University of California,
Berkeley, California.

Dear Doctor Goodspeed:

Reference is made to Mr. Hoyt's letter to you of June 28, 1938, confirming the renewal of the Memorandum of Agreement between this Bureau and the Division of Forestry of the California State Department of Natural Resources, the California State Department of Agriculture, and the College of Agriculture, Department of Botany, and Botanical Garden, University of California relative to cooperative work in controlling white pine blister rust for the fiscal year beginning July 1, 1938. The information as to the funds to be expended under this Memorandum of Agreement is now available.

It is agreed that the expenditures for this work during the fiscal year beginning July 1, 1938, shall be approximately $36,800 by the Bureau of Entomology and Plant Quarantine, and a total of approximately $10,500, including services, by the State agencies named. If this meets with your approval, will you please so indicate by signing and returning the carbon copy of this letter, retaining the other copy for your files.

Very truly yours,

/s/ Lee A. Strong,

Chief of Bureau.

Concurred in:

/s/ A. R. Davis, Acting
Director, Botanical Garden, University of California.

October 28, 1938

Mr. A. R. Davis, Chairman,
Department of Botany,
University of California,
Berkeley, California.

Dear Mr. Davis:

Reference is made to Mr. Hoyt's letter to you of June 28, 1938, confirming the renewal of the Memorandum of Agreement between this Bureau and the Division of Forestry of the California State Department of Natural Resources, the California State Department of Agriculture, and the College of Agriculture, Department of Botany, and Botanical Garden, University of California relative to cooperative work in controlling white pine blister rust for the fiscal year beginning July 1, 1938. The information as to the funds to be expended under this Memorandum of Agreement is now available.

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Very truly yours,

/s/ Lee A. Strong,

Chief of Bureau.

Concurred in:

/s/ A. R. Davis
Chairman, Department of Botany,
University of California.

UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
REGION FOUR
601 Sheldon Building
San Francisco, California

April 27, 1938

For-I-7

Memorandum to: National Park Superintendents
National Monument Custodians
Inspectors

Subject: Ribes Eradication

The California National Parks within the sugar pine belt are for the first time going into Ribes eradication on a large scale due to the presence of the White Pine Blister Rust in Northern California. The successful protection of five-needled pines from this exotic fungus is a highly scientific problem which, fortunately for California, has been largely solved through experimental work followed by field practice in the northwestern and eastern regions of the United States. The agencies responsible for the control of the blister rust are the Bureau of Plant Industry, Division of Forest Pathology and the Bureau of Entomology and Plant Quarantine. The former is responsible for the scientific investigation of the fungus and the latter for its control. The National Park Service through its Branch of Forestry has working agreements with both of these agencies to furnish the Park Service with technical advice and assistance in the control of tree diseases. This cooperative program is briefly outlined in the Manual of the Branch of Forestry and this memorandum is merely to enlarge upon the manner in which the local officers of the Bureau of Entomology and Plant Quarantine will assist us in the solution of our problem.

The work of the Bureau of Entomology and Plant Quarantine for purposes of Blister Rust control is divided into two phases; first, eradication and second, inspection and checking. Each phase is administered by a separate group of their personnel and each is more or less administratively independent in the field. The eradication is administered by the Operations Supervisors and checking by the Checking Supervisors. The assistance and advice of both of these groups will be provided in the national parks by the Bureau of Entomology and Plant Quarantine.

Ribes eradication in the national parks is, of course, the responsibility of the Park Superintendents with advice and assistance from the Branch of Forestry through the Regional Forester and the Bureau of Entomology and Plant Quarantine through its local officers. Due to their training and experience in blister rust control the Operation and Checking Supervisors of the Bureau of Entomology and Plant Quarantine should be requested to give as much of their time as possible to actual supervision of our work in the field.

The Operation Supervisor will examine all phases of the eradication work and records with the Park Superintendent's representative and point out to them ways and means of improving them. His findings and recommendations will be given orally, or when sufficiently important or when deemed desirable, they will be submitted in writing to the Park Superintendent. The Operation Supervisor will report to the Park Superintendent any disregard of recommendations that he feels necessary for maximum efficiency in blister rust control work.

In checking work the Bureau of Entomology and Plant Quarantine is concerned primarily in obtaining an accurate report of the Ribes conditions on areas having received eradication work in order to determine whether the standards of control have been reached or whether further eradication is required and where. Checking is largely a specialized technical job developed by the Bureau, and the Checking Supervisor is in a better position to administer it than anyone else. Furthermore, it is necessary to inspect frequently the field work of each checker in order to maintain a high standard of thoroughness and accuracy in the checking data themselves and this function is customarily assumed by the Checking Supervisor. The Checking Supervisor will assign and lay out the work of the checkers through the representative of the Park Superintendent and should be allowed freedom in supervising the checking work. All checking reports will be verified by the Checking Supervisor and submitted by him to the Park Superintendent.

To plan Ribes eradication work properly the Bureau of Entomology and Plant Quarantine is in the habit of making preliminary surveys of proposed work areas. Such surveys will be necessary from time to time upon national park areas. These preliminary examinations, which are as intensive as time and the availability of money will permit, reveal accurate information on the abundance and distribution of Ribes on special eradication problems, both of which directly affect the cost of control work. They are usually performed by a small group of experienced men, usually not more than a half dozen. As these surveys are obviously a Bureau function, Bureau men will retain full responsibility

for and full field direction of them under the Park Superintendent. The Bureau's supervisor responsible for the survey will keep in touch with the Park Superintendent, advising him of the progress of the work. At the conclusion of the job the Bureau will furnish a complete report of results to the Park Superintendent.

The Bureau of Entomology and Plant Quarantine has signified its desire to collaborate with us in all phases of blister rust control work in the national parks, and has offered the utmost in cooperation. The intent of the Bureau is not to encroach upon the administration of park work, but merely to assist in the execution of a technical job and to make available its store of specialized knowledge and trained personnel.

For your convenience a list of the Bureau's personnel who will be directly concerned this year with field work in the parks follows:

W. V. Benedict - Regional Leader,
Sugar Pine Region

T. H. Harris - Regional Checking Supervisor

For the parks the following individuals will have immediate cooperating supervision:

Crater Lake

Conrad P. Wessela - Operation Supervisor
Lyle N. Anderson - Checking Supervisor

Lassen

Benton Howard - Operation Supervisor
S. Daryl Adams - Checking Supervisor

Yosemite and General Grant

Frank A. Patty - Operation Supervisor
John N. Mitchell - Checking Supervisor

<u>Sequoia</u>

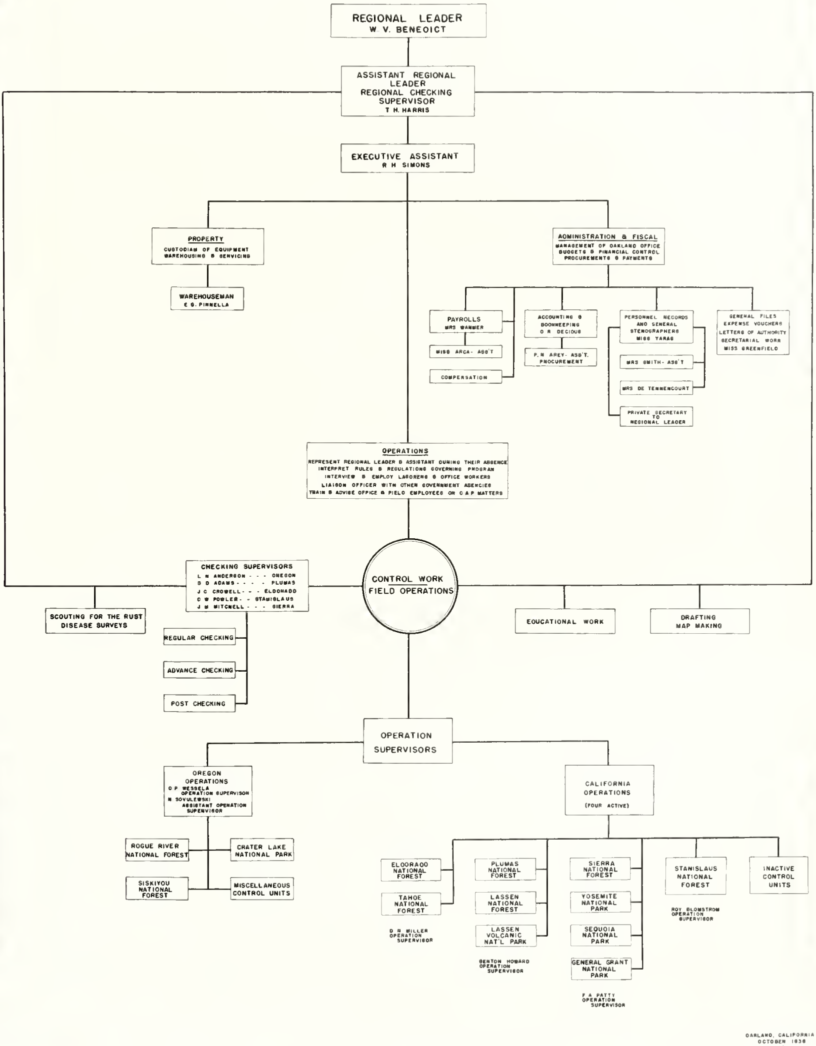
Frank A. Patty - Operation Supervisor
T. H. Harris - Regional Checking
Supervisor
John N. Mitchell - Checking Supervisor
(if a preliminary survey should
be scheduled)

Sincerely yours,

/s/ Frank A. Kittredge,
Regional Director.

THE SUGAR PINE REGION

DIVISION OF PLANT DISEASE CONTROL
BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE
U S DEPARTMENT OF AGRICULTURE



OAKLAND, CALIFORNIA
OCTOBER 1938
H E G

TABLE 1

CLASSIFIED BUREAU EXPENDITURES BY APPROPRIATIONS AND PROJECTS - SUGAR PINE REGION

January 1 to December 31, 1938

Item	Appropriation	Plumas and Lassen	Sierra	Eldorado	Stanislaus	Expenditures Not Directly Chargeable to Field Projects	California Scouting	*Methods Unit	Sub-Total	Oregon	Totals
Salaries: Permanent Employees	EQ-Regular 1281300.090	$ 1,599.96	$ 1,666.41	$ 2,928.82	$ 2,899.92	$ 5,664.91		$ 7,887.88	$ 22,647.90	$ 4,204.05	$ 26,851.95
	" " 1291300.090	1,599.96	1,696.58	2,874.99	2,962.47	5,750.68		7,971.74	22,856.42	3,462.72	26,319.14
	WPA-Emergency 501082	-	-	-	-	2,350.00		-	2,350.00	-	2,350.00
	" " 701082	-	-	-	-	1,674.99		-	1,674.99	-	1,674.99
	WPA-Administrative 501009	-	-	-	-	-		-	-	-	-
	" " 01-06/8999	-	-	-	-	1,299.96		-	1,299.96	-	1,299.96
	" " 701089	-	-	-	-	527.49		-	527.49	-	527.49
	" " 701009	-	-	-	-	1,707.48		-	1,707.48	-	1,707.48
Total - - - - - - - - - - - - - - - - - - -		3,199.92	3,362.99	5,803.81	5,862.39	18,975.51		15,859.62	53,064.24	7,666.77	60,731.01
Salaries: Temporary Employees	EQ-Regular 1281300.090	2,011.63	610.61	1,399.38	875.25	180.00	-	396.00	5,472.87	358.00	5,830.87
	" " 1291300.090	584.77	958.52	24.35	13.50	240.00	$ 588.00	775.00	3,184.14	10.25	3,194.39
	WPA-Emergency 501082	3,549.57	13,548.62	10,862.39	7,576.32	17,281.07	-	985.98	53,803.95	21,904.11	75,708.06
	" " 701082	21,852.97	25,233.48	34,509.25	16,921.51	10,999.68	454.10	490.00	110,460.99	50,060.11	160,521.10
	WPA-Administrative 501009	-	-	-	-	-	-	-	-	-	-
	" " 01-06/8999	-	-	-	-	-	-	-	-	-	-
	" " 701089	-	-	-	-	172.50	-	-	172.50	-	172.50
	" " 701009	-	-	-	-	1,916.50	-	-	1,916.50	-	1,916.50
Total - - - - - - - - - - - - - - - - - - -		27,998.94	40,351.23	46,795.37	25,386.58	30,789.75	1,042.10	2,646.98	175,010.95	72,332.47	247,343.42
Equipment: Non- and Semi-Expendable	EQ-Regular 1281300.090	715.00	-	-	714.99	1,793.40	-	650.77	3,874.16	1,124.04	4,998.20
	" " 1291300.090	-	-	-	-	-	-	11.20	11.20	-	11.20
	WPA-Emergency 501082	864.73	985.72	1,011.63	1,079.35	284.30	-	0.50	4,226.23	1,329.74	5,555.97
	" " 701082	74.19	138.08	56.24	55.66	72.17	8.44	-	404.78	73.67	478.45
	WPA-Administrative 501009	-	-	-	-	26.18	-	-	26.18	-	26.18
	" " 01-06/8999	-	-	-	-	-	-	-	-	-	-
	" " 701089	-	-	-	-	-	-	-	-	-	-
	" " 701009	-	-	-	-	13.56	-	-	13.56	-	13.56
Total - - - - - - - - - - - - - - - - - - -		1,653.92	1,123.80	1,067.87	1,850.00	2,189.61	8.44	662.47	8,556.11	2,527.45	11,083.56
Subsistence Supplies	EQ-Regular 1281300.090	-	-	-	-				-	-	-
	" " 1291300.090	-	-	-	-				-	-	-
	WPA-Emergency 501082	2,154.29	5,533.55	7,101.06	5,782.70				20,571.60	7,555.48	28,127.08
	" " 701082	7,642.04	10,305.08	10,665.20	4,079.87				32,692.19	14,926.81	47,619.00
	WPA-Administrative 501009	-	-	-	-				-	-	-
	" " 01-06/8999	-	-	-	-				-	-	-
	" " 701089	-	-	-	-				-	-	-
	" " 701009	-	-	-	-				-	-	-
Total - - - - - - - - - - - - - - - - - - -		9,796.33	15,838.63	17,766.26	9,862.57				53,263.79	22,482.29	75,746.08
Miscellaneous Supplies and Other Expenses	EQ-Regular 1281300.090	-	-	-	-	8.36	-	102.04	110.40	-	110.40
	" " 1291300.090	-	-	-	-	-	-	57.26	57.26	-	57.26
	WPA-Emergency 501082	1,227.21	1,107.44	1,571.61	643.58	4,054.79	-	189.35	8,793.98	1,954.06	10,748.04
	" " 701082	530.61	571.79	925.58	427.67	3,331.54	0.25	16.62	5,804.06	1,793.47	7,597.53
	WPA-Administrative 501009	-	-	-	-	72.68	-	-	72.68	-	72.68
	" " 01-06/8999	-	-	-	-	-	-	-	-	-	-
	" " 701089	-	-	-	-	3.77	-	-	3.77	-	3.77
	" " 701009	-	-	-	-	483.35	-	-	483.35	-	483.35
Total - - - - - - - - - - - - - - - - - - -		1,757.82	1,679.23	2,497.19	1,071.25	7,954.49	0.25	365.27	15,325.50	3,747.53	19,073.03
Transportation and Travel	EQ-Regular 1281300.090	-	-	-	-	-	10.20	362.95	373.15	247.39	620.54
	" " 1291300.090	-	-	-	-	-	-	674.08	674.08	-	674.08
	WPA-Emergency 501082	1,658.78	2,015.37	1,993.77	1,525.66	448.90	-	18.43	7,660.91	1,217.09	8,878.00
	" " 701082	1,432.93	970.95	1,537.37	757.28	484.68	229.80	47.25	5,460.26	1,011.86	6,472.12
	WPA-Administrative 501009	-	-	-	-	-	-	-	-	-	-
	" " 01-06/8999	-	-	-	-	-	-	-	-	-	-
	" " 701089	-	-	-	-	36.24	-	-	36.24	-	36.24
	" " 701009	-	-	-	-	151.83	-	-	151.83	-	151.83
Total - - - - - - - - - - - - - - - - - - -		3,091.71	2,986.32	3,531.14	2,282.94	1,121.65	240.00	1,102.71	14,356.47	2,476.34	16,832.81
Totals by Appropriation	EQ-Regular 1281300.090	4,326.59	2,277.02	4,328.20	4,490.16	7,646.67	10.20	9,399.64	32,478.48	5,933.48	38,411.96
	" " 1291300.090	2,184.73	2,655.10	2,899.34	2,975.97	5,990.68	588.00	9,489.28	26,783.10	3,472.97	30,256.07
	WPA-Emergency 501082	9,454.58	23,190.70	22,540.46	16,607.61	24,419.06	-	1,194.26	97,406.67	33,960.48	131,367.15
	" " 701082	31,532.74	37,219.38	47,693.64	22,241.99	16,563.06	692.59	553.87	156,497.27	67,865.92	224,363.19
	WPA-Administrative 501009	-	-	-	-	98.86	-	-	98.86	-	98.86
	" " 01-06/8999	-	-	-	-	1,299.96	-	-	1,299.96	-	1,299.96
	" " 701089	-	-	-	-	740.00	-	-	740.00	-	740.00
	" " 701009	-	-	-	-	4,272.72	-	-	4,272.72	-	4,272.72
Grand Totals - - - - - - - - - - - - - - - -		$47,498.64	$65,342.20	$77,461.64	$46,315.73	$61,031.01	$ 1,290.79	$20,637.05	$319,577.06	$111,232.85	$430,809.91

* Accounting records maintained at Oakland office, but expenditures apply to Northwestern Region as well as Sugar Pine Region.

PART II

RIBES ERADICATION

By

Roy Blomstrom and Conrad P. Wessela,
Associate Foresters

INTRODUCTION

The 1938 Ribes eradication program in California embraced control measures on five national forests and three national parks. The work on the Plumas, Eldorado, Stanislaus, and Sierra National Forests was a continuation of the yearly program that has been in progress on these forests since 1934. The project on the Lassen National Forest was a renewal of the eradication work started in 1931, which had been discontinued until this year. An allocation of CCC labor made it possible to begin control measures on two new operations, the Lassen and General Grant National Parks, and to continue the program of Ribes eradication that was started in 1933 on Yosemite National Park.

Ribes eradication for the control of white pine blister rust in Oregon during 1938 was confined to the Upper Rogue River basin on the Rogue River National Forest. This year marked the sixth consecutive year of control activities on this forest, during the last four of which the programs were Federally sponsored under WPA, and which saw initial control work practically completed on the Upper Rogue unit. The required reeradication was also brought up to date on this control unit.

The status of Ribes eradication work in the Sugar Pine Region at the close of the field work in 1938 is shown in Table 1. As recorded in this table, 651,710 acres have received initial treatment; 107,031 acres have received second treatment; 7,145 acres and 5,063 acres have received third and fourth treatments respectively.

During the peak of the 1938 field season approximately 3,100 men quartered in 35 camps were employed on Ribes eradication in the Sugar Pine Region. Of the total number of men employed 2,040 were located in 18 camps and were hired in accordance with the regulations of the Works Progress Administration; 1,000 were CCC enrollees quartered in 15 camps and financed by CCC funds; and 60 men located in two camps were employed through an allocation of Forest Service regular funds.

ORGANIZATION AND ADMINISTRATION

Oregon

An operation supervisor, an assistant, and a checking supervisor, all permanent employees of the Bureau of Entomology and Plant Quarantine, formed the nucleus of the supervisory personnel. During the active field season an assistant to the operation supervisor was employed to manage the procurement of supplies and other clerical work at the operation headquarters maintained at Medford, Oregon.

Throughout the greater part of the field season, four camps, two with 150 men each and two with about 70 men each, were operated under the immediate supervision of trained camp foremen. Also, an appointed supervisory cook and baker in charge of the mess was employed in every camp. All other positions except checking positions were filled with certified relief clients in order to comply with WPA regulations stipulating that at least 95 percent of the total personnel paid from emergency funds must have relief status and be paid the security wage established by the State Administrator. These wage rates for a 120-hour month were as follows: Professional and technical, $75.60; skilled, $69.60; semi-skilled, $55.20; and unskilled, $48.00.

For the first time since the inception of the WPA program in Oregon in 1935, sufficient laborers were available to utilize all allotted emergency funds. Relief labor was recruited from Coos, Douglas, Josephine, Jackson, and Klamath Counties throughout the season, and as a whole proved to be slightly more qualified for Ribes eradication work than labor drawn in previous years. However, as in prior years, qualified material for strawbosses and assistant camp foremen was the major stumbling block to efficiency in field work, especially in the 150-man camps.

California

Three agencies conducted Ribes eradication work in California during 1938, namely, (1) the Bureau of Entomology and Plant Quarantine, (2) the U. S. Forest Service, and (3) the National Park Service. Field operations were financed through allotments of WPA, CCC, and regular funds. Table 7 lists the size and location of each camp, the agency responsible for the work, and the type of funds with which the camps were financed.

With the exception of the Lassen National Forest which was combined with the Plumas National Forest to form one operation, control measures on each national forest were administered by three permanent employees: the Bureau operation and checking supervisors, and the Forest Service blister rust officer. The Bureau field men were responsible for the supervision and maintenance of the camps financed by the Bureau. In addition, the Bureau operation supervisor worked in close contact with the Forest Service blister rust officer in maintaining standards of efficiency and in planning and directing a uniform Ribes eradication program for the individual forest. The Bureau checking supervisors were in direct charge of all checking work in the region.

Two of the Bureau operation men working in collaboration with William J. Endersbee, Field Coordinator, National Park Service, Washington, D. C., Emil F. Ernst, Assistant Forester of Yosemite National Park, and Albert Wall, Park Commissioner of Lassen National Park, assisted in the technical administration of Ribes eradication on the three national parks.

The Bureau project in California consisted of seven camps - five camps with 100 men each, and two camps with 150 men each, employing throughout the greater part of the season, 800 men. The entire program was financed by an allotment of ERA funds. The majority of the camps opened the last part of May and, except for one camp on the Sierra, closed during the last two weeks of September. One camp on the Sierra remained open until November 3, when inclement weather forced it to move to winter quarters.

During the peak of the season the Forest Service in California had 1,550 men engaged on Ribes eradication. The program consisted of seven ERA camps in which 800 men were employed, and all or portions of eight CCC camps in which 690 CCC enrollees were assigned to blister rust control work; and late in July an allotment of regular funds made possible the addition of two 30-man regular fund camps on the Stanislaus Forest. Field activities commenced in early June and with the exception of the CCC camps terminated early in October. The majority of the CCC camps continued work until the first of November.

The Park Service Ribes eradication project consisted entirely of CCC labor and during the peak of the season 325 CCC enrollees were employed in seven different camps. One camp started work during the last week of April and continued until the first of November. The remaining camps did not commence work until the last part of June and early July; and they terminated work in September.

Field headquarters on each national forest were established at the Forest Supervisor's headquarters. During the field season an assistant to the operation supervisor was employed on each operation to handle office routine and procurement of supplies. To avoid unnecessary duplication, only one service and supply was maintained for both the Bureau and the Forest Service camps.

Camp organization varied, depending upon the type of funds used to finance the project. An appointed camp foreman was employed to administer each WPA camp. The kitchen and mess were under the direct supervision of one appointed cook and baker. Owing to the restrictions placed upon WPA allotments, the remaining camp personnel were certified relief clients. From the relief personnel in camp it was necessary to select four to six assistant campbosses and strawbosses to assist the camp foreman in supervising the field work. Also it was necessary to select from one to three cooks and from four to six flunkies to assist the head cook in maintaining the kitchen and mess. With the exception of one Forest Service camp in Placer County, the wage rates in the California WPA camps for a 120-hour month were $66.60 for professional and technical; $60.00 for skilled; $49.20 for semi-skilled; and $43.80 for unskilled. The wage rate for Placer County was $69.60, $63.60, $49.20 and $43.80 for professional, skilled, semi-skilled, and unskilled, respectively. The board deduction was 30 cents a day.

In the regular 33-man camps the overhead consisted of one appointed camp foreman and one strawboss. The kitchen was run by one appointed cook, assisted by one capable flunky. The remaining camp personnel were secured from the open labor market. Crew leaders received 55 cents per hour and laborers 45 cents per hour. The men were required to work 44 hours per week, but as four hours on Saturday constituted a full day, they received pay for 48 hours. Subsistence deductions were made at the rate of 75 cents per day.

The organization of the CCC camps varied with each forest and camp. In camps where the majority of the men were employed on blister rust work, the camp superintendent, assisted by three or more foremen under the immediate direction of one of the regular blister rust supervisors, supervised the field work. In spike camps and camps that had only a small percentage of

the men in the camp engaged on blister rust work, a senior foreman was appointed to take charge of the field work. Where additional supervision was needed, from one to three junior assistant technicians were hired by the Forest Service and paid out of regular funds.

Security wage workers were assigned by the District Office of the Works Progress Administration in San Francisco. The majority of the laborers were secured from the metropolitan centers and transient camps in the central part of the state. The work agency transported all the men from the point of hire to the camps. The relief clients secured for work in 1938 were of the same low caliber as in previous years. The majority of the laborers were in poor physical condition, disliked camp life, and were improperly clothed and temperamentally unsuited for woods work. Drunkenness was a common source of trouble. Except during the first month of the season, there were never enough men to maintain the camps at full strength.

Requisitions from the field for men for both the Bureau and the Forest Service projects were handled by the state WPA office in San Francisco. Work orders seldom accompanied the men, frequently arriving after the men had quit or had been discharged. This caused a great deal of confusion and delay in paying the men. Improper routing of men to the different operations likewise caused considerable expense and lost motion.

The labor in the Forest Service regular camps was far superior to either WPA or CCC labor. Local men experienced in woods work were secured through the facilities of the National Reemployment Service. Because of the late season start, many of the better local men were already employed for the summer by the neighboring logging companies. However, all the local men secured were physically fit, properly clothed for woods work, and accustomed to camp life. One half of the men were held in camp each week end for fire duty. There was never a shortage of labor.

LOCATION AND DESCRIPTION OF AREAS

Oregon

The areas treated initially and for the second time during 1938 are shown in colors on the accompanying map of the Rogue River National Forest. The area covered in previous years and the area remaining to be treated on this forest is also designated on this map. In order to obtain better control units from the standpoint of size, shape, and pathological knowledge of blister rust, every effort was made to cover those areas which would join or enlarge areas from which Ribes had been eradicated in previous years. As a whole this work represented the most costly and difficult Ribes eradication encountered on the Rogue River National Forest to date. The heavy population of Ribes binominatum, dense ground cover, and steep topography were the major factors contributing to this condition.

California

The area covered before 1938, the portion that received initial and reeradication during 1938, and the area remaining to be worked are depicted in color for each forest and park on the accompanying maps and are supplemented by the respective written descriptions. The bases for

the selection of areas worked during 1938 were: (1) the need for reeradication, (2) the need for eradication work on areas adjacent to those worked in preceding years, and (3) locating ERA and CCC camps in areas supporting a heavy Ribes population.

Lassen National Forest

One Bureau ERA camp and two CCC camps constituted the eradication forces on the Lassen National Forest.

The Soda Springs CCC camp in the southeastern part of the forest, worked an area of sugar pine that was logged originally over 50 years ago, and which the Diamond Match Company started relogging during 1938. The area now supports a good stand of young-mature, pole, and advance sugar pine reproduction. The topography is gentle and brush density about 0.5. Ribes were few, though no Ribes-free areas were present. The timber stand is rapidly closing in and the Ribes population is on the decline. The principal owner is the Diamond Match Company.

The Deer Creek CCC and the Gurnsey ERA camps eradicated Ribes from the Deer Creek-Round Valley area, which received its initial working during 1931. Topography is moderate, brush density light, and Ribes sparse. Sixty-three percent of the area was Ribes free. The Red River Lumber Company and Curtis Collins and Holbrook are the two largest owners.

The Gurnsey Creek ERA camp worked largely on initial eradication in Mill Creek Canyon. This was the vicinity of the blister rust infection discovered in 1937. Topography was rough, brush heavy, and Ribes numerous, the R. inerme-willow association along Mill Creek being the principal eradication problem. The floods of last winter covered a good part of the R. inerme-willow type with debris and silt, which added to eradication difficulties. Ownership is divided between numerous private holders of small areas and the Federal Government.

Fires on neighboring forests took a toll of 1,250 CCC man days.

Plumas National Forest

Ribes eradication was continued on the Plumas National Forest during 1938 in the vicinity of Butt Lake and Humbug Valley by one CCC camp and four ERA camps. One CCC spike camp in Meadow Valley started second eradication on an area treated initially in 1934.

The area worked was rugged and brushy; Ribes were plentiful. Because of the severe storms of last winter, windfalls increased the eradication problem in many areas. At times it was necessary to limb the windfalls and pile the brush before eradicating the Ribes.

The Humbug CCC camp continued with the mechanical eradication of R. inerme-willow association along Miller and Yellow Creeks.

All the camps worked on areas adjacent to those worked in previous years. Because of the heavy snow pack and consequent impassable roads the camps could not begin operations until early June. The principal owners are the Federal Government and Red River Lumber Company.

Eldorado National Forest

There were four ERA camps and one CCC camp of about 100 men each doing Ribes eradication work on the Eldorado National Forest during the summer of 1938. The CCC camp, which was operated by the Forest Service, worked in the Cosumnes River basin on the southern end of the forest. Of the 1,400 acres completed by this camp, 61 percent is in Federal ownership and the remainder belongs principally to the California Door Company.

Three Bureau camps continued operations in the northern end of the Forest in the Georgetown Divide area. There were 9,046 acres worked in this area, and of this amount 13 percent is Federally owned. The large private owner in this area is the Michigan-California Lumber Company.

Control activities were begun for the first time on the extreme northern end of the forest, which lies between the Middle Fork of the American River and the Rubicon River. The Forest Service here operated one camp in the vicinity of Goggins Mine. Of the 2,195 acres covered, 48 percent is in Federal ownership; the other large owner is the Southern Pacific Land Company. The area supports belts of virgin timber interspersed with brush patches. Some portions have good sugar pine but in general the pine is only fair. Ribes are generally numerous.

Stanislaus National Forest

The Ribes eradication program on the Stanislaus consisted of two ERA camps, one full strength CCC camp, one CCC spike camp, and two 30-man regular fund camps. With the exception of the Bureau camp at Thompson Meadows all the work was reeradication of Ribes from areas worked initially in 1933 and 1934.

The Bureau camp at Thompson Meadows continued with the program of initial eradication begun in 1935. Owing to the heavy Ribes concentrations, prevalence of brush, and rough terrain, progress has been slow. The West Side Lumber Company owns the greater portion of this area.

The Forest Service ERA camp at Cow Creek continued second, third, and fourth eradication on the Strawberry unit in the central part of the Forest. The area is cut-over type, brush is heavy, and Ribes regeneration prolific. Ninety percent of the area is in Federal ownership.

One CCC camp and the two regular fund camps commenced reeradication work between the Middle Fork and the North Fork of the Stanislaus River. The area was worked initially in 1934. The terrain is moderate, Ribes sparse, and the brush is largely confined to the ridges. The area supports a good stand of virgin timber and advance reproduction. The Pickering Lumber Company extended their logging operations this year to include a part of the control area. The Federal Government and Pickering Lumber Company are the two large owners.

The remaining CCC camp, located at Buck Meadows, completed reeradication on 1,240 acres of virgin timber located in the extreme southern end of the Forest. The area was worked initially in 1934; topography is moderate, Ribes light, and brush sparse. The Federal Government and Yosemite Lumber Company are the principal owners.

Sierra National Forest

Ribes eradication work on the Sierra consisted of three 150-man ERA camps and one CCC camp. The camps were in the northern part of the Forest where they covered 7,901 acres initially and 8,916 acres on re-eradication.

The majority of the initial eradication work by the Bureau camp on Miami Creek was on the lands of the Yosemite Mountain Ranch. The greater portion of the area was the most difficult eradication work ever encountered on the Sierra. Ribes roezli and Ceanothus cordulatus were so closely associated on parts of the area that a partial slash job was necessary to insure effective eradication. The area was logged about 40 years ago and now supports an excellent stand of young pole sugar pine. Reeradication from this camp was confined to 1,185 acres in the vicinity of Fish Camp that were worked initially in 1935. Ribes regeneration in this area is prolific and a third working will be necessary.

Working conditions on the area covered by the two Forest Service ERA camps and one CCC camp are varied. Chowchilla Ridge represents an area well served with roads; the terrain is steep, brush light, and sugar pine reproduction sparse or scattering. The area was logged under Forest Service regulations about 1929. Ribes are abundant, averaging well over 1,000 to the acre, and regeneration of R. roezli is prolific. About 80 percent of the work on this area was reeradication of Ribes from areas worked initially in 1935 and 1936. The Footman Ridge area supports a scattering of sugar pine reproduction; topography is very steep or precipitous, ground cover consists of open brush and bear clover, and Ribes are few except for localized patches of R. roezli and R. amarum at the heads of draws. About 40 percent of the area is cut-over.

The Pine City Mountain area is readily accessible by roads. The topography is moderate; old cut-over lands, heavily burned, predominate; ground cover conditions vary from exceedingly heavy to moderate. Ribes range from exceedingly abundant to few and no Ribes-free areas were found. Sugar pine reproduction is sparse except for the excellent stands localized in the draws. Ribes regeneration is prolific.

The Soquel Basin supports an excellent stand of second growth sugar pine, poles, saplings, and reproduction. Ribes concentrations are heavy, but regeneration is negligible, owing to a closed cover of reproduction. The topography is moderate, and the area is readily accessible by roads.

Lassen Volcanic National Park

The first Ribes eradication on Lassen Volcanic National Park was started during 1938. Special use areas adjacent to the Loop Highway and Lassen Peak trail and supporting stands of Pinus monticola, P. albicaulis. and P. lambertiana were given initial treatment.

The rugged Sulphur Works unit along the Loop Highway supports scattered stands of P. monticola and a light ground cover of brush. The principal Ribes species, R. montigenum, occurred in large mats and the individual Ribes were so closely associated and interlaced that it was necessary to treat the entire mat as one bush. A trench about 12 to 16 inches deep was dug along the lower edge of these patches of Ribes and by

a process of undercutting, the Ribes were removed. The stems and crowns were piled, and to complete the job the ground was thoroughly raked with an ordinary garden rake.

The Lake Helen-Lassen Peak unit was established to afford protection to the P. albicaulis along the trail to Lassen Peak and in the vicinity of Bumpus Mountain, Lake Helen, and the Loop Highway. This area is very steep and rough, has many cliffs, rock slides, and steep ridges, and ranges from 7,500 to 10,000 feet in elevation. Eighty-seven percent of the area was Ribes free. Ribes montigenum, the only species of Ribes found on this unit, occurred in two localized places and rarely grew more than a few feet from the low-hanging branches of P. albicaulis and Tsuga mertensiana.

The high use area adjacent to Manzanita and Reflection Lakes comprised the Manzanita Lake unit, consisting of stands of P. monticola and P. lambertiana. This unit, 62 percent of which was completed during 1938, is brushy and extremely rocky; the Ribes bushes were difficult to eradicate. Ribes population varies from Ribes free to heavy. The principal eradication problems encountered were brush and the difficulty of eradicating large R. cereum bushes growing in rock crevices.

The entire Lassen Park eradication job was done with CCC labor, enrollees from the Park CCC Camp 1 working on the Manzanita Lake area, and enrollees from the Park CCC Camp 3 on the Sulphur Works and Lake Helen-Lassen Peak areas.

Yosemite National Park

Ribes eradication on Yosemite National Park was conducted from three CCC camps and one CCC spike camp. The Crane Flat Camp was entirely devoted to blister rust work and the remaining three camps detailed from 30 to 50 men on Ribes eradication.

The Crane Flat and the Merced Grove spike camps worked primarily on lands logged 10 to 15 years ago. The Ribes bushes were large, deep rooted, and closely associated with Ceanothus cordulatus, making progress slow. The area supports a good stand of sugar pine reproduction and is all in Federal ownership.

The Middle Fork Camp worked in the vicinity of the Tuolumne Grove of Big Trees, Ribes population ranged from light to medium, topography is moderate, and brush light or in small scattered patches. The area supports an excellent stand of mature sugar pine and advance reproduction.

The Wawona Camp worked in both logged and unlogged stands in the vicinity of the Mariposa Grove of Big Trees. The steep terrain in the vicinity of Wawona retarded eradication, Ribes concentrations ranged from light to medium. The area is all in Federal ownership.

General Grant National Park

On General Grant National Park, 40 enrollees from the Cedar Spring CCC Camp were assigned to blister rust control work. The Park is composed of four sections supporting excellent stands of mature sugar pine and harboring several groves of Big Trees. The Park ranges in elevation from 5,000 to 7,000 feet; except for the precipitous western edge the terrain

is generally moderate. Ribes were generally distributed and on the cooler slopes were closely associated with Ceanothus and wild cherry. The more exposed manzanita covered ridges generally supported few Ribes. Large groups of Ribes cereum presented the most difficult eradication problem.

Ribes-to-Pine Spread Plots, Shasta National Forest

During 1938 six Ribes-to-pine spread plots were established on the Shasta National Forest by the Office of Forest Pathology, Bureau of Plant Industry. Three of the plots are in the eastern part of the Forest in the vicinity of Bartle in sec. 6, T. 39 N., R. 2 E. and secs. 30 and 31, T. 40 N., R. 2 E., M. D. M. The other three plots are in the western part on Clear Creek in secs. 27, 33, and 34, T. 36 N., R. 6 W., M. D. M.

At the request of the Office of Forest Pathology the Ribes were removed from these plots under the supervision of the Bureau of Entomology and Plant Quarantine by a crew of 20 local men paid from regular funds of the Bureau. Standard California eradication practices were used in eradicating the Ribes, and each area was given a regular five percent check following eradication work. A summary of the work accomplished is shown below:

Acres Covered	Eight-Hour Man Days Expended	Ribes Eradicated
510	243	42,374

METHODS OF WORK

Oregon

No deviations of importance from standardized hand eradication methods were employed. However, one method involving the decapitation of Ribes and the application of dry chemical to the cut crown and one method of eradicating R. cereum by means of a specially constructed grapple or plow arrangement drawn by a team of horses are worthy of mention.

Some streams in the Upper Rogue River unit have cut deep gorges bounded by cliffs. Ribes sanguineum and R. cruentum growing on the faces of these cliffs represent a dangerous and difficult eradication problem. In order to remove these plants, a three-man crew of above the average in agility and intelligence was organized. One member of the crew was lowered over the face of a cliff by means of a five-eighths inch Manila rope, handled by the two remaining members. Some bushes were pulled by the man suspended on the rope; the majority, however, were clipped off at the crown by a pair of pruning shears, and dry chemical, either ammonium thiocyanate or a mixture of sodium chlorate and borax, was applied to the cut crown. This method proved much easier and more rapid as a rule than attempting to remove the plants with a pick.

Ribes cereum in the Upper Rogue River unit grows in extensive concentrations usually on pumice flats associated with brush and lodgepole pine. In an association of this sort it develops into a large clump having a crown spread of from four to twenty-four inches. Plants of that size are difficult to eradicate by hand. Records show that an average laborer will

dig about 100 clumps in eight hours. Eradication costs, therefore, become very high since these R. cereum areas often support from 300 to 400 large clumps per acre. In order to reduce the cost of eradication R. cereum, a method developed in 1934 was employed and refined. This method consists of pulling large R. cereum clumps with a specially constructed grapple or plow drawn by a team of horses. In order to operate the grapple, three men were needed: one to guide the grapple, one to drive the team, and one to clear away pulled bushes from unpulled ones in order that the horses might be maneuvered more effectively. The grapple operator and bush clearer exchanged jobs at regular intervals, because one man cannot endure eight continuous hours of operation of the plow and still maintain maximum production.

The results of the above described method of R. cereum eradication are as follows:

Acres covered................................	88
Eight hour man days expended..................	56
Eight hour team and teamster days............	28
Ribes cereum pulled	32,012
Ribes cereum pulled per acre..................	364

Costs:	
56 man days at $6.50 (estimated cost of effective eight-hour man day for Oregon operation in 1938)................................	$ 364.00
28 team and teamster days at $8.00...........	224.00
Total cost...................................	588.00
Cost per acre................................	6.88
Cost per pulled bush.........................	.018

Hand eradication of R. cereum on the same area would have cost about $2,082 on the basis of a cost of $6.50 for an effective eight-hour man day. This would bring the cost per acre to $23.66 and the cost per bush to $0.065 as compared with $6.88 per acre and $0.018 per bush using a team of horses and grapple.

Eradicating R. cereum with horses is limited in its application; in order to be more efficient than hand pulling or digging, brush should not exceed 0.5 density, topography must be level enough for horses to work effectively, soil cannot be excessively rocky, and Ribes must average at least 150 bushes per acre.

California

During the winter of 1937-1938 the Ribes eradication data for the past several years were analyzed, and, coupled with the observations of the field personnel, a set of "Maintenance Standards" for California was prepared to be tested during the 1938 field season.

In accordance with the procedure outlined under the "Maintenance Standards" all areas except those supporting a heavy Ribes population were advance or post checked prior to Ribes eradication. From the results of these checks the areas were segregated into four Ribes concentration classes. The Ribes concentration classes and their corresponding "Standards of Control" are as follows:

Class Number	Ribes Concentration Class	Standards of Control
1	Less than 25 feet live stem per acre.	Less than 25 feet live stem per acre.
2	Twenty-five feet live stem to 30 bushes per acre.	One bush and 8 feet live stem per acre.
3	Thirty-one to 150 bushes per acre.	Two bushes and 16 feet live stem per acre.
4	Over 150 bushes per acre (1) Seedlings rare (2) Seedlings many	(1) Not over 25 feet live stem per acre. (2) No one bush over 25 feet of live stem.

These numerical concentration classes were used as a basis for defining the ecological conditions of each section. The ecological conditions which in general these classifications portray are:

Class 1. Ribes-free areas. For some reason these areas are not conducive to Ribes growth and until disturbed do not present a control problem.

Class 2. The second classification of 25 feet live stem to 30 bushes per acre indicates an area where the Ribes are on the decline and which should remain in a Ribes-free state after one thorough eradication.

Class 3. The third class, 30 bushes to 150 bushes per acre, indicates an area where the Ribes growth is in equilibrium and where one eradication may or may not establish control.

Class 4. Those areas supporting over 150 bushes per acre indicate an area where the Ribes are on the increase and where two or more workings will be necessary to establish control.

These ecological classifications were established in an effort to expedite eradication work by applying only the proper amount of eradicative effort on each area. For example, areas in the number 2 classification should receive a most thorough eradication job in an effort to suppress the Ribes in one treatment. In group 4 the Ribes are so numerous that some sprouting will take place and seedlings will produce new plants, so that only enough work should be done to remove the large and fruiting bushes, in other words, to remove the source of additional seed.

All operations tried this method during the 1938 field season and found it to be of value not only in this season's work, but also in intelligently planning the reeradication work aimed at the permanent suppression of Ribes. Slight changes will be made as the need arises and as more complete information is secured.

Standard methods of hand eradication were altered slightly to meet existing conditions resulting from the type of labor in the ERA and in the CCC camps. Because of the limited experienced supervision in the ERA and

in the CCC camps the initial training of large numbers of inexperienced men in three-man crews was impracticable. Training areas supporting heavy Ribes concentrations were selected and the men were trained in a group for several days in digging practices and Ribes identification. By this method of close supervision it was possible for the foreman and his assistants to select qualified crew leaders and to organize each crew before assigning it to a regular crew block. Training areas, which were located within control unit boundaries, were reworked later in the season.

Because of the shortage of qualified crew leaders it was often necessary to deviate from the standard three-man crew and to work larger sized crews. Large crews were common in the CCC camps where crew leaders received no additional compensation for the added duties and responsibilities. In an effort to alleviate this shortage of CCC crew leader material, one operation quartered eight WPA crew leaders at a neighboring CCC camp and assigned to them the poorer enrollees in groups of four to six. This method increased production and promoted efficiency.

On limited stream areas on the Sierra National Forest, R. nevadense reached optimum development; here it grows in solid patches from six to eight feet in height and thickly interlaced with alder and willow, making it extremely difficult and costly to remove Ribes crowns and buried stems by the usual hand eradication methods. Several auxiliary methods were tried but only one, which consisted of blasting with 20 percent stumping powder, proved practicable. This method was tried first in 1934 in removing clumps of willow and R. inerme on the Plumas National Forest. For blasting purposes a two-man crew proved most effective. One man located the large Ribes crown and with the use of a heavy steel bar made a hole 12 to 18 inches deep beneath the crown. The second man loaded the hole under each bush with a one-half pound stick of 20 percent blasting powder. The shots were wired in series and set off six to ten at a time by means of a hand-turned magneto detonator. Since only the large bushes were removed by blasting, a hand follow-up job was necessary to remove the small bushes and crown fragments left by blasting.

The two-man crew averaged 100 large crowns per day. Blasting opened the area and made the hand mop-up work much easier. The powder had the greatest effect in wet soil.

Eradication work by this method cost 25-1/2 cents per bush. A conservative estimate indicates a saving of at least half the cost of doing the same amount of work by hand methods. However, there are certain disadvantages which cannot be overlooked; there is increased danger to the workmen, a certain amount of fire hazard, and the effectiveness is reduced on dry and rocky sites.

Mechanical Eradication on the Plumas Forest

The mechanical eradication of Ribes and brush in 1938 was a continuation of the project started in 1937 along Miller Creek. This year all the brush removal work was completed on Miller Creek and operations were extended to include the lower part of Yellow Creek.

The regeneration of R. inerme in this locality is very slight except under the protection of willow, and it is apparent that the removal of the brush and not the duff and leaf mold is the principal factor involved in the permanent suppression of R. inerme. Based on these facts the method of mechanical Ribes eradication was altered. Instead of removing the brush, duff, leaf mold, and some top soil as in 1937, the operator was instructed this year to remove the brush and disturb the soil as little as possible.

A narrow fringe of brush was left along the stream channels to check erosion. In several places it was necessary to drain the area before the machine could operate. All mop-up work and drainage was done by hand, using CCC labor.

After the first fall rains all the brush removed this season, as well as the piles remaining from last year, was burned and the area seeded to grass. The seed was sown with a hand broadcast seeder and covered by the use of a brush drag.

A total of 12 acres was covered by mechanical means during the season. A great deal of time was lost owing to the breakdown of the tractor, to fires, and to the necessity of using the machine on other types of work.

RESULTS

Oregon

Reeradication work in Oregon revealed a decided decline in Ribes population as a result of first workings in 1934 and 1935. On 31,940 acres which have received a second treatment and for which accurate records are available, an average of 140 Ribes per acre were destroyed the first working. Second workings performed on the same area three and four years later resulted in the eradication of an average of 23 Ribes bushes per acre. In other words, the Ribes population had been reduced 85 percent as a result of the first eradication. In addition the post check prior to the second working revealed that Ribes-free area increased from 49 percent at the time of the advance check to 64 percent of the total 31,940 acres. This means that approximately 50 percent of the area worked on the Upper Rogue Unit is on a maintenance basis and that an additional 14 percent has met the standards of the four-year control classification after the completion of one working. Because of the light Ribes growth encountered in second eradications to date, there is every reason to believe that the area requiring a third working will be comparatively small.

Regeneration of Ribes from seed appears to be negligible, except for certain species and certain areas. Fully nine-tenths of the Ribes pulled on reeradication work are sprouts from stem or crown tissue remaining in the soil. Present indications are that higher elevations will show heavier regeneration from seed, and that R. klamathense in lower elevations will regenerate profusely both by seeds and sprouts. However, compared to the whole, those areas lying in the higher elevations are small, and R. klamathense grows only in small scattered patches in the southern part of the unit.

California

In California second eradication formed a large part of the work during 1938. Reeradication was conducted only on those areas where Ribes regeneration had reached a point where follow-up work could no longer be delayed without endangering the permanent suppression objective.

On the Lassen National Forest 17,340 acres of virgin timber worked initially in 1931 by regular labor were covered on second eradication by CCC and WPA crews during 1938. On initial eradication 9,349 acres were blocked out as Ribes free, whereas on second eradication 10,991 acres were inspected and passed as Ribes free. Eleven hundred acres or 12 percent of the 9,349 acres that blocked out in 1931 did not meet the efficiency standards this year and required additional crew work. The more rigid efficiency standards and the more thorough check in 1938 accounts for the rework of the 1931 block out area. The Ribes per worked acre dropped from 43 in 1931 to 33 in 1938. Although not shown in the tabular results, the drop in Ribes per acre would have been much more pronounced but for the decided increase of Ribes on two recently disturbed areas. These two areas of 754 acres (640 acres of cut-over and 114 acre burn) represent only 12 percent of the worked acreage yet they supported 71 percent of the total Ribes eradicated. Excluding the disturbed area the Ribes dropped to 10 per worked area.

On the Stanislaus National Forest the bulk of the second eradication work was performed on a virgin timbered area between the Middle and North Fork of the Stanislaus River that had been worked initially in 1934 by NIRA crews. The work this year was done from two regular 33-man camps and one CCC camp. During the summer 20,010 acres were covered; 6,126 acres or 29 percent of the area was inspected and passed as Ribes free. On this same area in 1934, 2,604 acres or 12 percent of the area was classed as block out. The Ribes per worked acre dropped from 63 in 1934 to 21 in 1938. Two hundred twenty acres that blocked out as Ribes free in 1934 required crew work this season.

An accurate comparison of the output of the different types of labor is difficult to make. A comparison can be drawn between CCC and regular labor for the Stanislaus where the two worked comparable adjacent areas. Converting the effective man hours of each project into eight-hour man days discloses the following results:

Regular Camps			CCC Camps		
Worked Acres	Man Days	Ribes	Worked Acres	Man Days	Ribes
8,294	2,654	141,233	6,590	7,097	170,984

A further breakdown reveals that the men in the regular camps covered 3.1 and the CCC 0.9 acres per man day. On the basis of worked acreage the regular camps were 3.4 times as effective.

Unfortunately, there were no regular camps working in the vicinity of the ERA camps, and no comparison except the cost per effective man day can be made. By converting the effective man hours of both Stanislaus projects into six-hour man days the cost per effective man day for the regular camps is $4.82 and for ERA camps it is $4.52.

Closely associated with the high cost of the effective ERA man day is the rate of labor turnover. The following tabular classification shows the number of men that left camp by two-week, six-week, and ten-week periods and the number of men remaining until the end of the season. The figures shown are based on the first full assignment of men in camp and do not include any replacements that were secured during the season.

Forest	Total Men First of Season	Turnover in Percent of Original Assignment of Men				
		0-2 Weeks	Two Weeks to Six Weeks	Six Weeks to Ten Weeks	Ten Weeks to Fourteen Weeks	End of Season
Lassen and Plumas	151	8.0	48.3	17.2	21.2	5.3
Eldorado	336	6.9	35.1	21.4	24.1	12.5
Stanislaus	156	2.6	35.9	22.4	11.5	27.6
Sierra	141	17.0	28.4	12.8	10.6	31.2
Average California	784	8.0	36.6	19.3	18.6	17.5
Oregon	376	10.1	16.5	15.7	16.0	41.7
Sugar Pine Region	1,160	8.7	30.1	18.1	17.8	25.3

There follows a list of the tables appearing in the eradication section.

Table 1 - Status of Ribes Eradication by Land Ownership in the Sugar Pine Region as of December 31, 1938. (Part A: California; Part B: Oregon; Part C: All Workings.)

This table presents the status of Ribes eradication as of December 31, 1938 for the Sugar Pine Region by National Forests, National Parks, and State Parks.

Part A, column 7, of the table shows that 516,342 acres out of a total of 2,186,662 acres within the control units have been covered by initial eradication in California.

Part B, shows that of 540,764 acres within the control units in Oregon, 135,368 acres have been worked once. In columns 7 to 15 are recorded the acres covered, man days expended, and Ribes eradicated by first, second, and third workings.

The method used in computing the acreage covered by second, third and fourth eradications (columns 10, 13 and 16) has been changed this year to present a figure compatible with the figures established in the master work plan for Ribes eradication in the Sugar Pine Region. In preparing the work plan, two assumptions based on past records were made

in estimating the number of acres that would require second and third eradication work. These assumptions are (1) only 75 percent of the area requiring initial work would need a second eradication, and (2) only 75 percent of the area worked twice would require a third working and that this amount of third work would cover the cost of all subsequent work required.

To comply with these basic stipulations the 1938 acreage figures for second, third, and fourth eradications (columns 10, 13 and 16) include only the worked acreage. The acreage that was inspected and passed as Ribes free is shown in the last column of Tables 3B and 4. The first working acreage figure shown in column 7 includes the area blocked out as Ribes free. This is true for all tables showing initial work.

The eradication summary tables, which combine initial and reeradication work, include areas blocked out on initial work and exclude those classed as Ribes free on reeradication.

Table 2 - Summary of all Ribes Eradication in the Sugar Pine Region, 1938.

This is a condensed table of the seasonal accomplishments showing acres worked, man days expended, and Ribes eradicated by class of eradication, agency, and type of funds. In Oregon, where the Forest Service did no eradication work, the seasonal accomplishments are all included under Bureau of Entomology and Plant Quarantine.

Table 3 - Summary of Ribes Eradication by Operations for California, 1938. (Part A: Initial Work; Part B: Reeradication; Part C: All Workings.)

This table shows by National Forest, National Park, Agency, and type of fund the acreage covered, man days expended, and Ribes eradicated by land ownership.

Part A, columns 3, 4, and 5, shows that out of a total of 51,389 acres covered on initial eradication during 1938, 4,749 or 9.2 percent of the area was Ribes free, and that 46,640 acres required work by crews. The effective man hours expended are shown in column 6; these figures are reduced to the nearest eight-hour man day and are recorded in column 15.

Part B, of Table 3 is a summary of reeradication by operations for California, 1938. The results of second, third, and fourth eradications are included in this table in the same form as in Part A. Column 4, acreage covered, includes only the area covered by crews. The area inspected and passed as Ribes free is shown in the last column.

Part C, of Table 3 summarizes the initial and reeradication work by land ownership for California during 1938.

Table 4 - Summary of Ribes Eradication for Oregon, 1938.

This table presents the results of the 1938 Ribes eradication program in Oregon. As the Bureau of Entomology and Plant Quarantine financed all the work through an allotment of WPA funds, initial and reeradication are shown in one table.

Table 5 - Ribes Eradicated by Species in California.

Table 6 - Ribes Eradicated by Species in Oregon.

The Ribes eradicated by species, by operations, and by initial and reeradication work are recorded in these tables.

Table 7 - The Distribution of Camps by Operation and County, in the Sugar Pine Region During 1938.

Table 8 - Adjusted Statement of Cost for the Sugar Pine Region Ribes Eradication Projects, 1938.

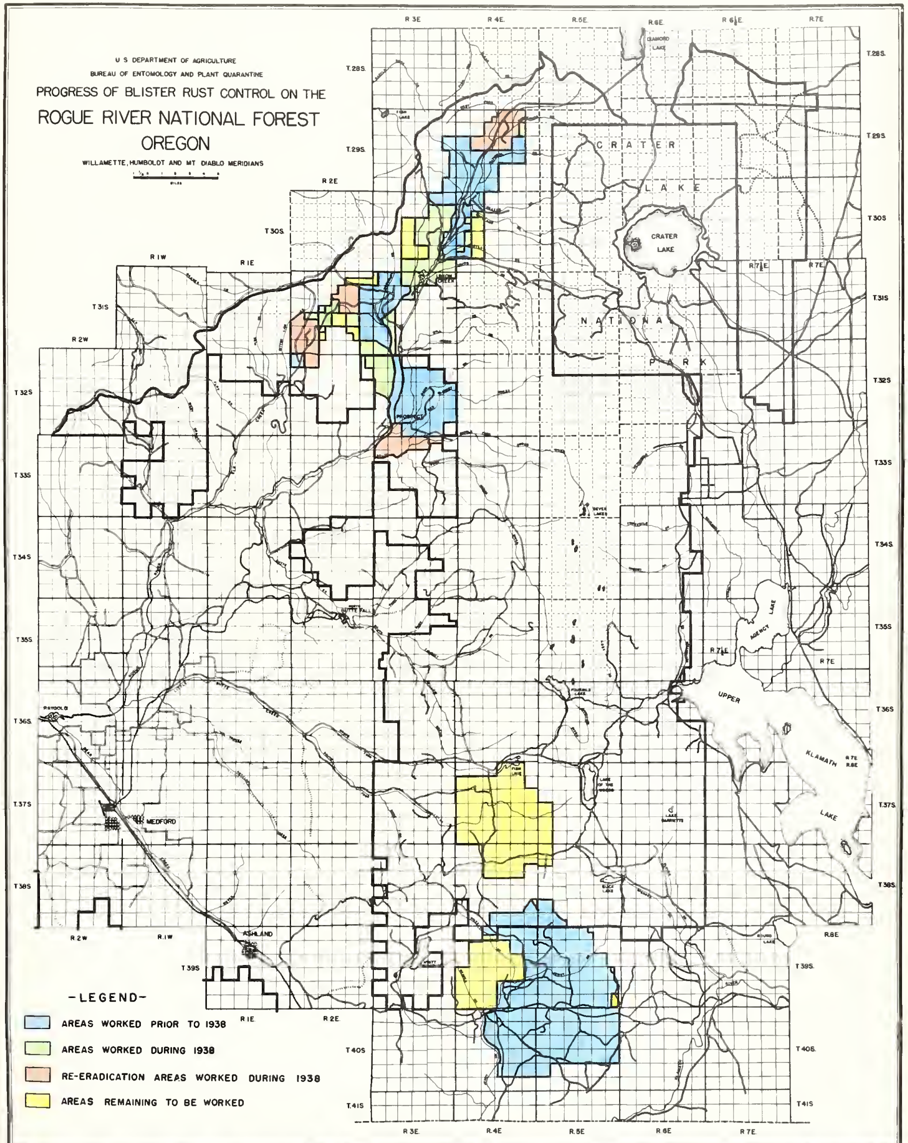
The expenditures recorded in this table are itemized by operation and include only the expenses that should be charged to field operations. Salaries of the permanent personnel and the cost of maintaining the Oakland office are omitted.

Table 9 - Meal Costs for the Ribes Eradication Projects of the Sugar Pine Region, 1938.

Chart 1 - The Status of Blister Rust Control in California, December 31, 1938.

Chart 2 - The Status of Blister Rust Control in Oregon, December 31, 1938.

These charts are a recapitulation of the figures in Table 1.


U S DEPARTMENT OF AGRICULTURE
BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE
PROGRESS OF BLISTER RUST CONTROL ON THE
ROGUE RIVER NATIONAL FOREST
OREGON
WILLAMETTE, HUMBOLDT AND MT DIABLO MERIDIANS
CRATER LAKE NATIONAL PARK
CRATER LAKE
UPPER KLAMATH LAKE
AGENCY LAKE
MEDFORD
ASHLAND
PROSPECT
BUTTE FALLS
UNION CREEK
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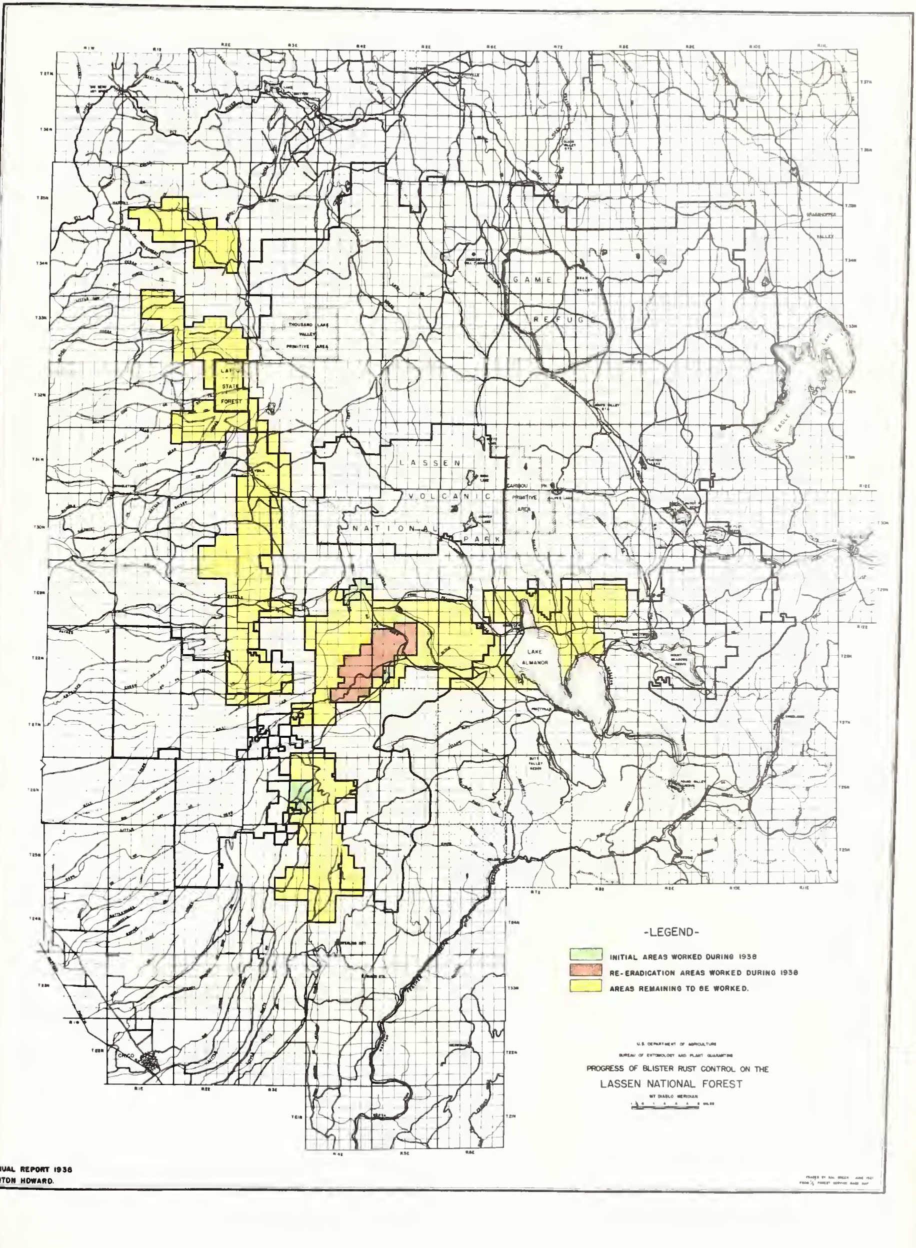
AREAS WORKED PRIOR TO 1938
AREAS WORKED DURING 1938
RE-ERADICATION AREAS WORKED DURING 1938
AREAS REMAINING TO BE WORKED


LASSEN
VOLCANIC
NATIONAL
PARK
GAME
REFUGE
LASSEN STATE FOREST
THOUSAND LAKE VALLEY PRIMITIVE AREA
CARIBOU PRIMITIVE AREA
LAKE ALMANOR
EAGLE LAKE
CHICO
-LEGEND-
INITIAL AREAS WORKED DURING 1938
RE-ERADICATION AREAS WORKED DURING 1938
AREAS REMAINING TO BE WORKED.
U.S. DEPARTMENT OF AGRICULTURE
BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE
PROGRESS OF BLISTER RUST CONTROL ON THE
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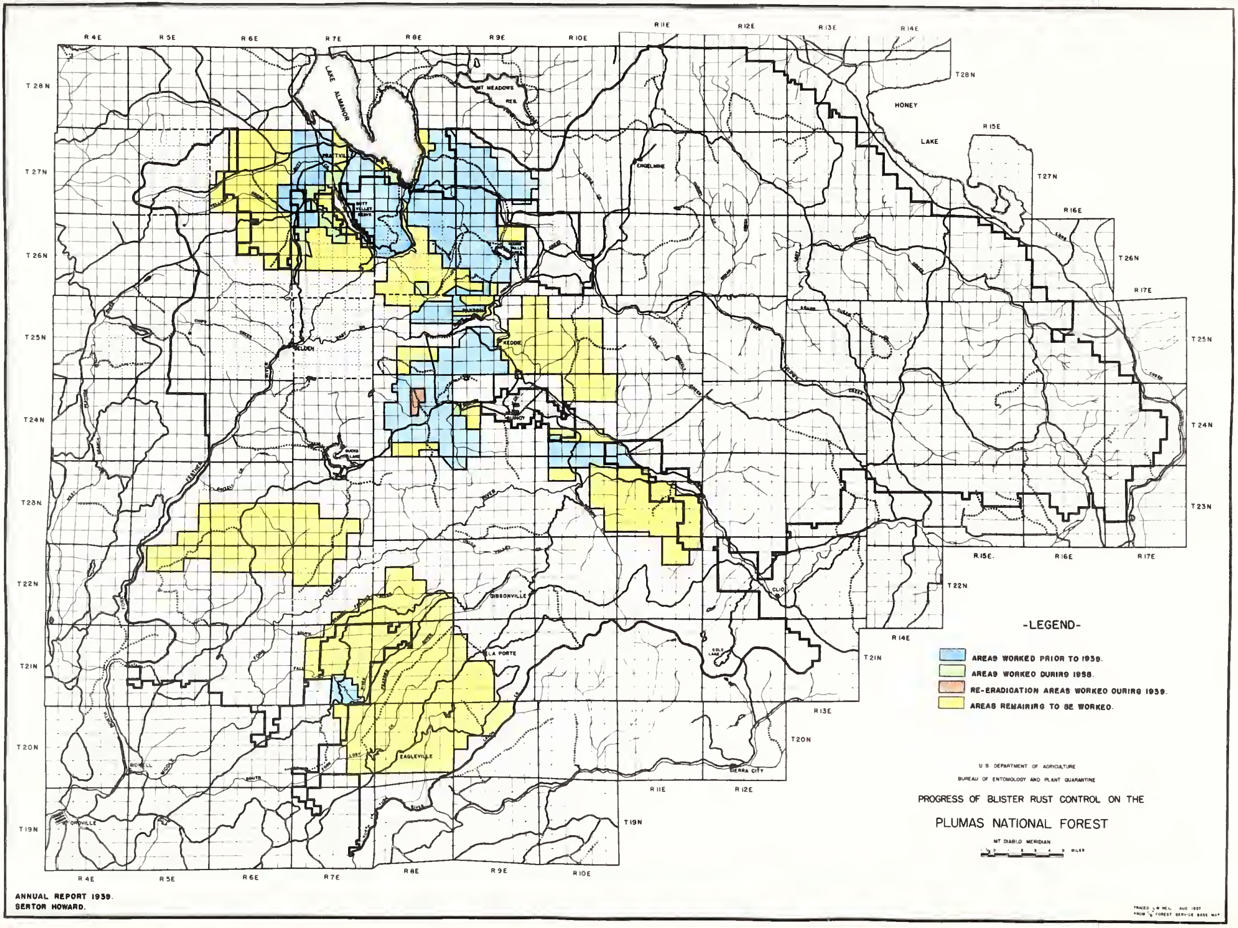
MT DIABLO MERIDIAN
ANNUAL REPORT 1938
BENTON HOWARD.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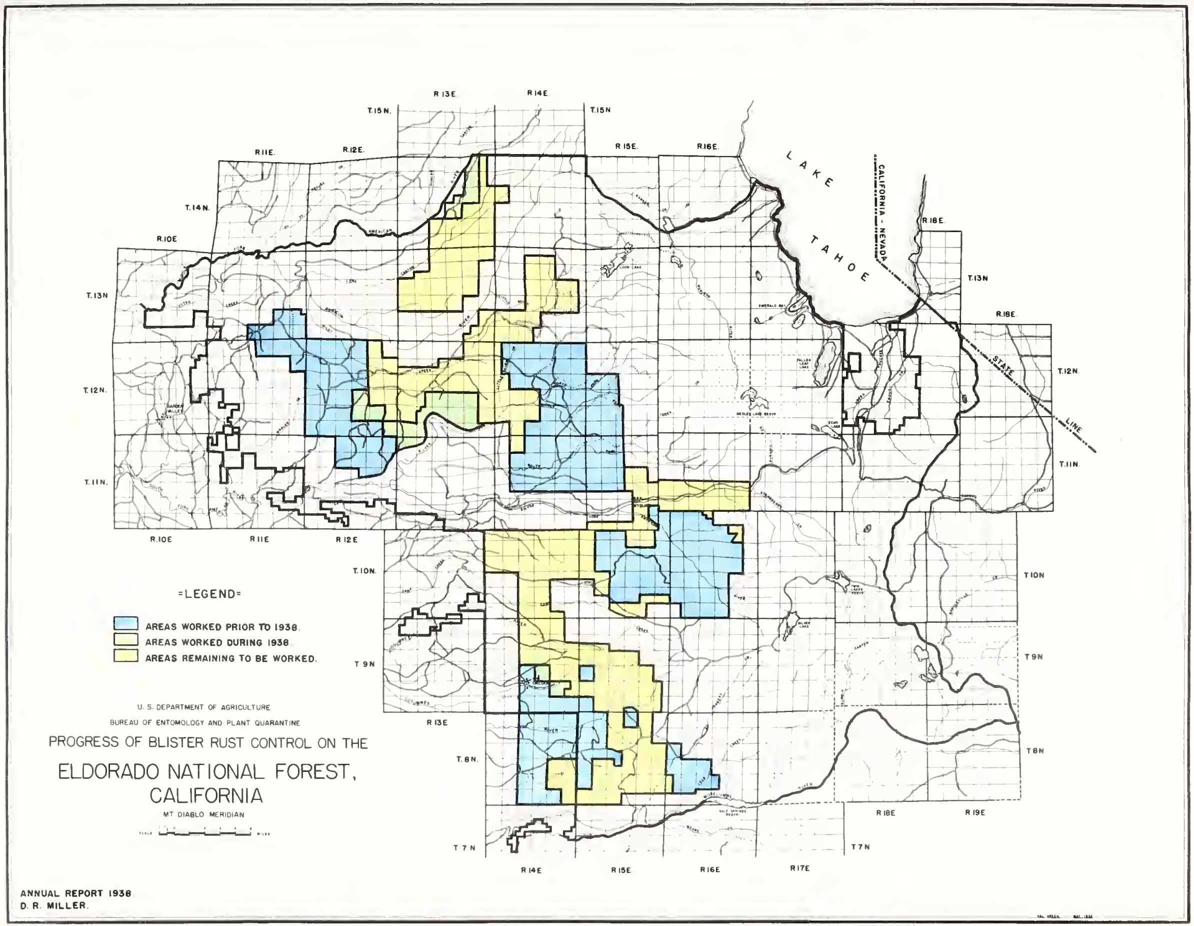
AREAS WORKED PRIOR TO 1939.
AREAS WORKED DURING 1938.
RE-ERADICATION AREAS WORKED DURING 1939.
AREAS REMAINING TO BE WORKED.
U.S. DEPARTMENT OF AGRICULTURE
BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE
PROGRESS OF BLISTER RUST CONTROL ON THE
PLUMAS NATIONAL FOREST
MT DIABLO MERIDIAN
LAKE ALMANOR
HONEY LAKE
MT MEADOWS RES.
QUINCY
KEDDIE
BELDEN
BUCKS LAKE
GIBSONVILLE
LA PORTE
EAGLEVILLE
CLIO
SIERRA CITY
OROVILLE
BIDWELL
ANNUAL REPORT 1939.
SERTOR HOWARD.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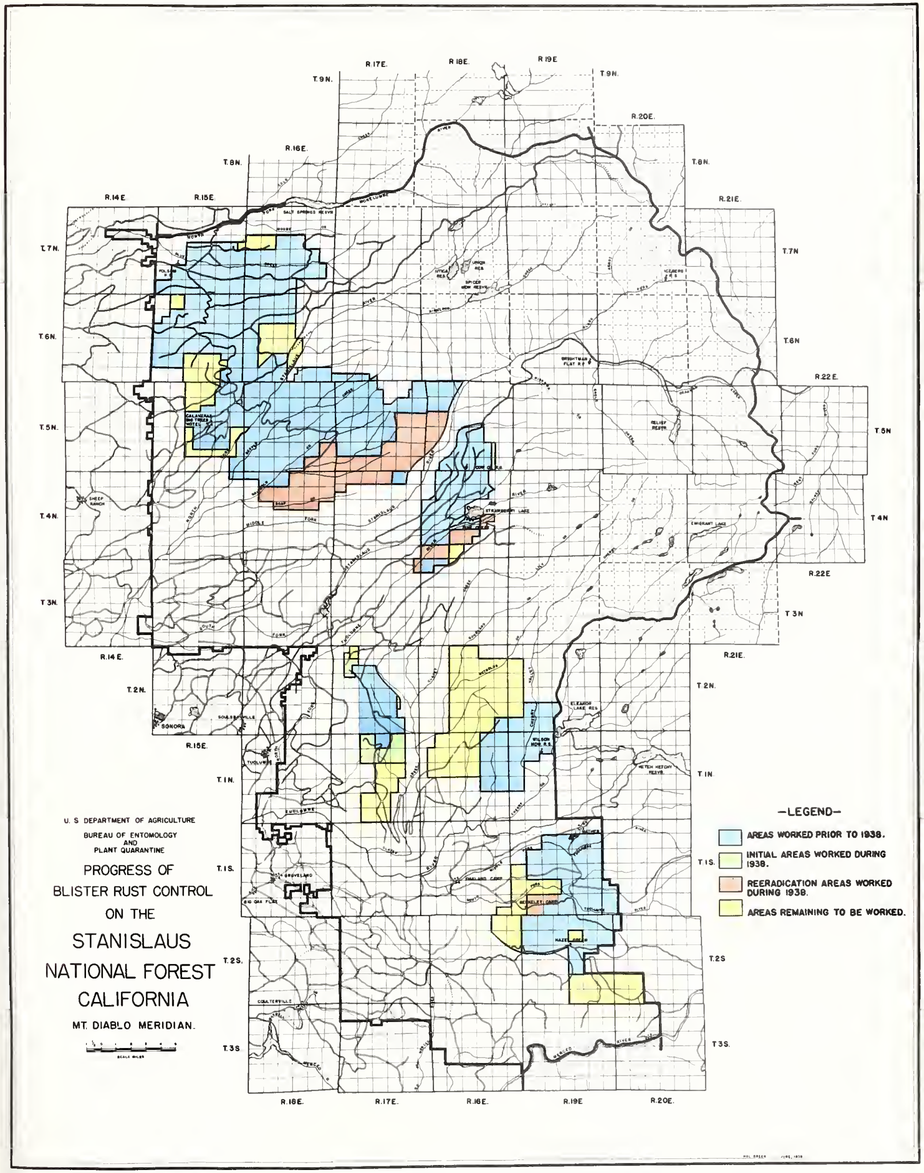
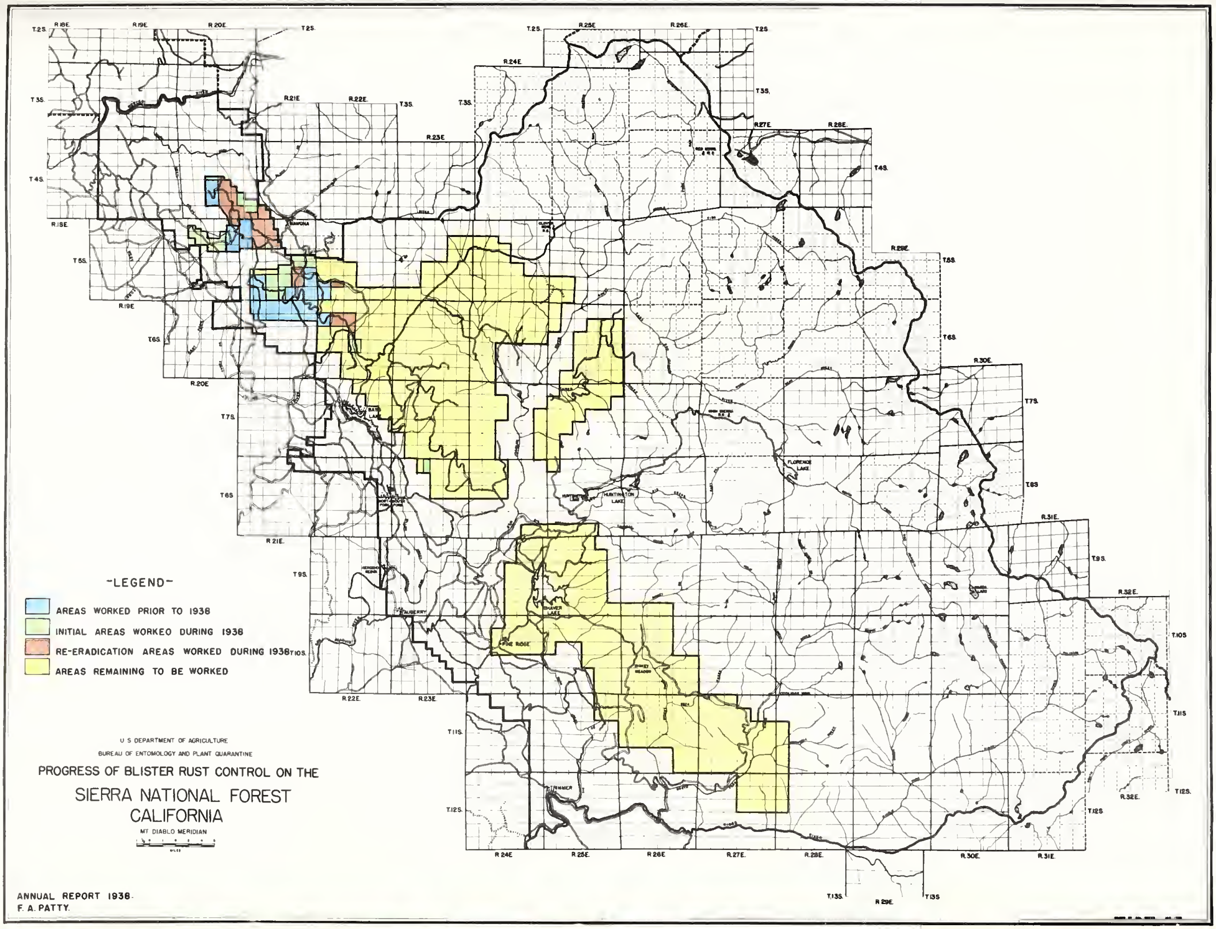
AREAS WORKED PRIOR TO 1938.
AREAS WORKED DURING 1938.
AREAS REMAINING TO BE WORKED.
U. S. DEPARTMENT OF AGRICULTURE
BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE
PROGRESS OF BLISTER RUST CONTROL ON THE
ELDORADO NATIONAL FOREST, CALIFORNIA
MT DIABLO MERIDIAN
ANNUAL REPORT 1938
D. R. MILLER.
LAKE TAHOE
CALIFORNIA - NEVADA
STATE LINE
R.10E
R.11E.
R.12E.
R 13E
R 14E
R 15E.
R.16E.
R.18E.
R 19E
R 17E
T.15N.
T.14N.
T.13N
T.12N.
T.11N.
T.10N.
T 9N
T.8N.
T 7N


U. S. DEPARTMENT OF AGRICULTURE
BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE
PROGRESS OF BLISTER RUST CONTROL ON THE
STANISLAUS NATIONAL FOREST
CALIFORNIA
MT. DIABLO MERIDIAN.
-LEGEND-
AREAS WORKED PRIOR TO 1938.
INITIAL AREAS WORKED DURING 1938.
REERADICATION AREAS WORKED DURING 1938.
AREAS REMAINING TO BE WORKED.
R.14E.
R.15E.
R.16E.
R.17E.
R.18E.
R.19E.
R.20E.
R.21E.
R.22E.
T.9N.
T.8N.
T.7N.
T.6N.
T.5N.
T.4N.
T.3N.
T.2N.
T.1N.
T.1S.
T.2S.
T.3S.
SONORA
TUOLUMNE
GROVELAND
BIG OAK FLAT
COULTERVILLE
STRAWBERRY LAKE
ELEANOR LAKE RES.
HETCH HETCHY RESVR.
EMIGRANT LAKE
WILSON MDW. R.S.
BERKELEY CAMP
HAZEL GREEN
CALAVERAS BIG TREES HOTEL
SHEEP RANCH
SALT SPRINGS RESVR.
UTICA RES.
UNION RES.
BRIGHTMAN FLAT R.S.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AREAS WORKED PRIOR TO 1938
INITIAL AREAS WORKED DURING 1938
RE-ERADICATION AREAS WORKED DURING 1938
AREAS REMAINING TO BE WORKED
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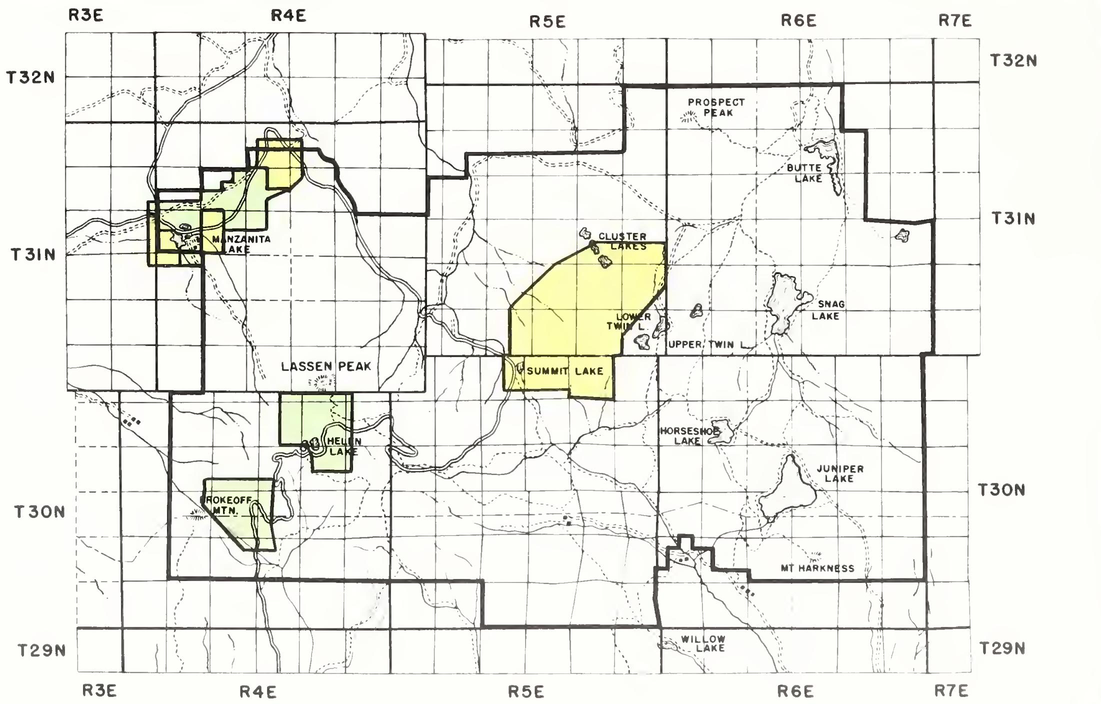
BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE
PROGRESS OF BLISTER RUST CONTROL ON THE
SIERRA NATIONAL FOREST
CALIFORNIA
MT DIABLO MERIDIAN
ANNUAL REPORT 1938.
F. A. PATTY.
WAWONA
BASS LAKE
HUNTINGTON LAKE
FLORENCE LAKE
SHAVER LAKE
PINE RIDGE
AUBERRY



-LEGEND-

AREAS WORKED DURING 1938.

AREAS REMAINING TO BE WORKED.

U. S. DEPARTMENT OF AGRICULTURE

BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE

PROGRESS OF BLISTER RUST CONTROL ON THE LASSEN VOLCANIC NATIONAL PARK.

-CALIFORNIA- MT. DIABLO MERIDIAN.

SCALE MILES 1 1/2 0 1 2

ANNUAL REPORT 1938.
BENTON HOWARD.

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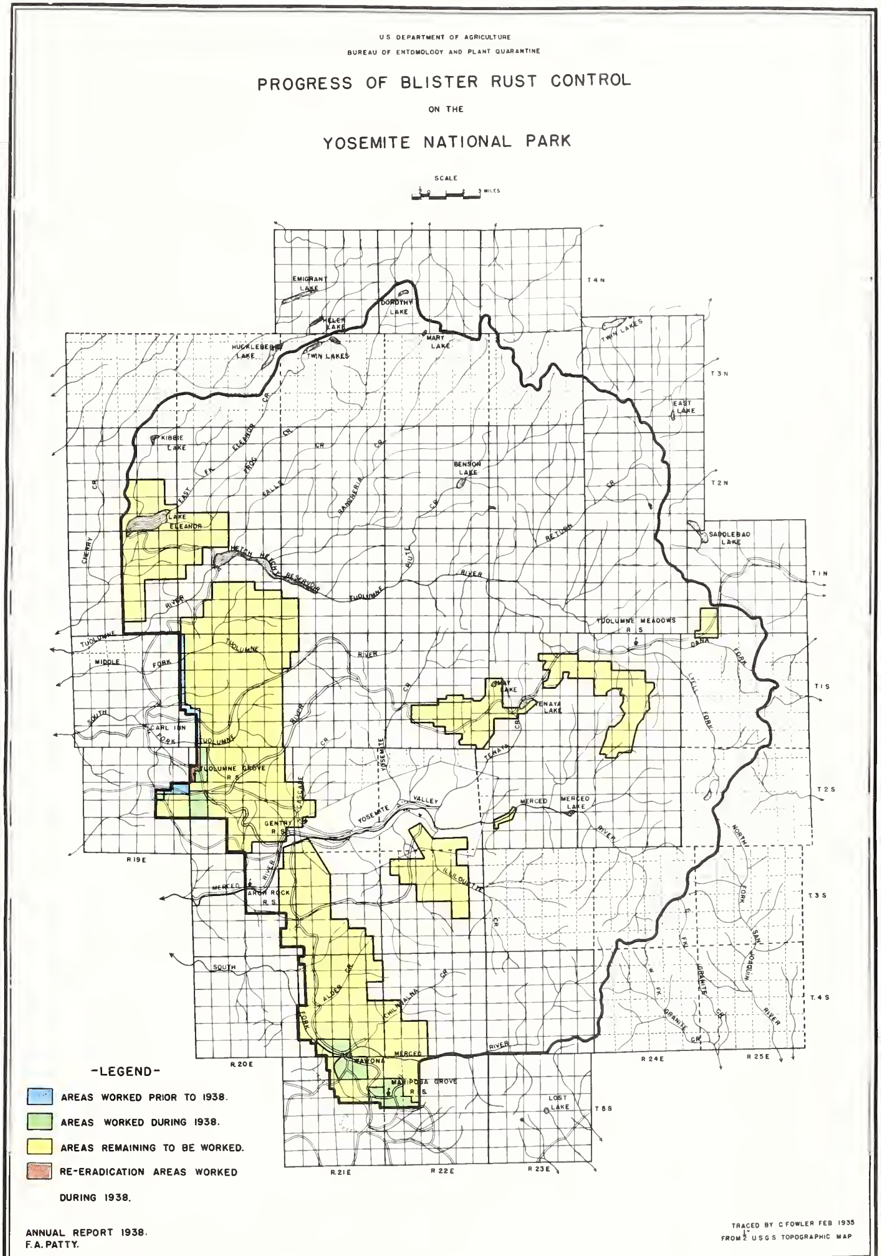

U.S. DEPARTMENT OF AGRICULTURE
BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE
PROGRESS OF BLISTER RUST CONTROL
ON THE
YOSEMITE NATIONAL PARK
SCALE
3 MILES
EMIGRANT LAKE
DOROTHY LAKE
HELEN LAKE
MARY LAKE
HUCKLEBERRY LAKE
TWIN LAKES
KIBBIE LAKE
BENSON LAKE
EAST LAKE
SADDLEBAG LAKE
LAKE ELEANOR
HETCH HETCHY RESERVOIR
TUOLUMNE RIVER
TUOLUMNE MEADOWS R.S.
TENAYA LAKE
MIDDLE FORK
SOUTH FORK
CARL INN
TUOLUMNE GROVE R.S.
GENTRY R.S.
YOSEMITE VALLEY
MERCED LAKE
MERCED RIVER
ARCH ROCK R.S.
ILLILOUETTE CR
WAWONA
MARIPOSA GROVE R.S.
LOST LAKE
T4N
T3N
T2N
T1N
T1S
T2S
T3S
T4S
T5S
R19E
R20E
R21E
R22E
R23E
R24E
R25E
-LEGEND-
AREAS WORKED PRIOR TO 1938.
AREAS WORKED DURING 1938.
AREAS REMAINING TO BE WORKED.
RE-ERADICATION AREAS WORKED DURING 1938.
ANNUAL REPORT 1938.
F.A. PATTY.
TRACED BY C. FOWLER FEB 1935
FROM 1/2 U.S.G.S. TOPOGRAPHIC MAP

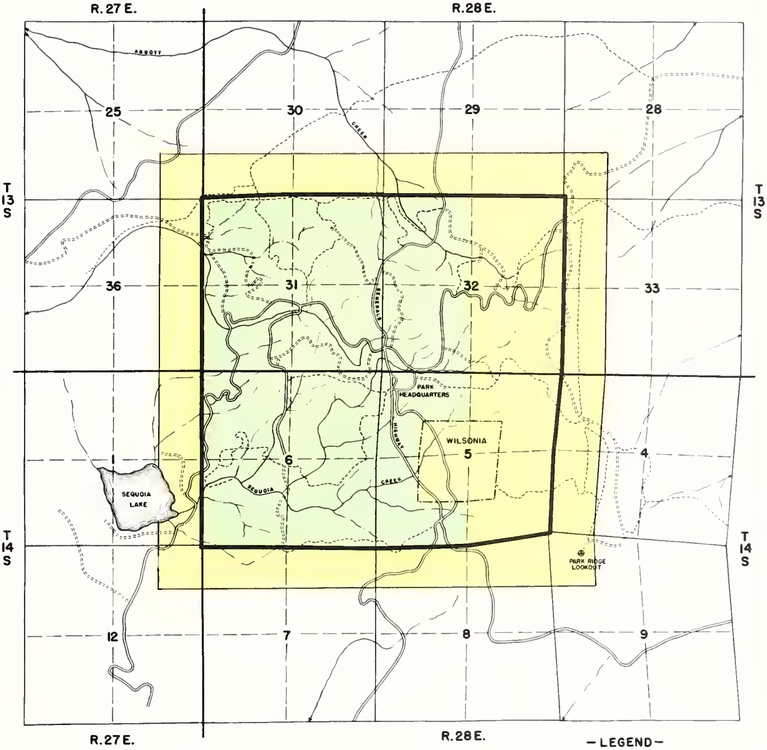
U. S. DEPARTMENT OF AGRICULTURE
BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE

PROGRESS OF BLISTER RUST CONTROL ON THE

GENERAL GRANT NATIONAL PARK

MT. DIABLO MERIDIAN

0 ½ 1
SCALE OF MILES



— LEGEND —

AREAS REMAINING TO BE WORKED
INITIAL AREAS WORKED DURING 1938

H E G DEC 1938

TABLE 1

THE STATUS OF RIBES ERADICATION BY LAND OWNERSHIP IN THE SUGAR PINE REGION AS OF DECEMBER 31, 1938

PART A - CALIFORNIA

Control Unit	Class of Ownership	Acreage of Control Units: White and Sugar Pine Type	Non-White and -Sugar Pine Type	Total Acreage	Acreage Unworked	Status of Eradication: First Working: Acres Worked	Man Days	Ribes	Second Working: Acres Worked	Man Days	Ribes	Third Working: Acres Worked	Man Days	Ribes	Fourth Working: Acres Worked	Man Days	Ribes	Total of All Workings: Acres Worked	Man Days	Ribes
NATIONAL FORESTS																				
Mendocino National Forest	Federal	16,290	4,727	21,017	21,017															
	Private	12,067	3,112	15,179	15,179															
	State	40	8	48	48															
	Total	28,397	7,847	36,244	36,244															
Trinity National Forest	Federal	107,288	15,287	122,575	122,575															
	Private	37,214	3,069	40,283	40,283															
	State	2,035	53	2,088	2,088															
	Total	146,537	18,409	164,946	164,946															
Klamath National Forest	Federal	24,690	6,615	31,305	31,305															
	Private	27,555	10,980	38,535	38,535															
	Total	52,245	17,595	69,840	69,840															
Shasta National Forest	Federal	2,615	996	3,611	3,611															
	Private	60,970	13,181	74,151	74,151															
	Total	63,585	14,177	77,762	77,762															
Lassen National Forest	Federal	35,634	19,220	54,854	49,803	5,051	1,579	317,449	1,339	375	9,462							6,390	1,954	326,911
	Private	205,080	40,341	245,421	225,857	19,564	7,935	1,091,422	5,010	2,179	200,621							24,574	10,114	1,292,043
	State	480	160	640	640	-	-	-	-	-	-							-	-	-
	Total	241,194	59,721	300,915	276,300	24,615	9,514	1,408,871	6,349	2,554	210,083							30,964	12,068	1,618,954
Plumas National Forest	Federal	150,458	43,211	193,669	134,125	59,544	34,237	7,320,594	5,082	2,076	160,760							64,626	36,313	7,481,354
	Private	140,459	28,193	168,652	108,406	60,246	37,677	7,864,782	1,571	905	103,324							61,817	38,582	7,968,106
	State	-	322	322	282	40	21	4,620	-	-	-							40	21	4,620
	Total	290,917	71,726	362,643	242,813	119,830	71,935	15,189,996	6,653	2,981	264,084							126,483	74,916	15,454,080
Tahoe National Forest	Federal	16,325	3,600	19,925	19,925															
	Private	18,063	1,920	19,983	19,983															
	Total	34,388	5,520	39,908	39,908															
Eldorado National Forest	Federal	86,584	40,040	126,624	67,329	59,295	28,573	8,264,005	3,242	2,631	166,300							62,537	31,204	8,430,305
	Private	110,837	21,398	132,235	56,619	75,616	44,545	11,925,148	2,336	2,103	179,873							77,952	46,648	12,105,021
	State	2,322	320	2,642	40	2,602	1,634	310,891	-	-	-							2,602	1,634	310,891
	Total	199,743	61,758	261,501	123,988	137,513	74,752	20,500,044	5,578	4,734	346,173							143,091	79,486	20,846,217
Stanislaus National Forest*	Federal	72,803	30,025	102,828	27,469	75,359	31,012	7,628,087	27,378	12,778	2,882,665	5,941	2,876	215,235	4,716	2,320	141,175	113,394	48,986	10,867,162
	Private	123,042	16,728	139,770	30,194	109,576	51,730	17,923,849	17,991	8,153	930,652	960	184	18,453	347	47	1,998	128,874	60,114	18,874,952
	State	320	87	407	-	407	129	16,768	-	-	-	-	-	-	-	-	-	407	129	16,768
	Total	196,165	46,840	*243,005	57,663	185,342	82,871	25,568,704	45,369	20,931	3,813,317	6,901	3,060	233,688	5,063	2,367	143,173	242,675	109,229	29,758,882
Sierra National Forest	Federal	144,163	134,267	278,430	251,902	26,528	53,357	11,717,709	8,576	6,873	3,646,954							35,104	60,230	15,364,663
	Private	47,980	18,670	66,650	61,262	5,388	10,362	2,374,887	340	438	66,121							5,728	10,800	2,441,008
	State	10	150	160	160	-	-	-	-	-	-							-	-	-
	Total	192,153	153,087	345,240	313,324	31,916	63,719	14,092,596	8,916	7,311	3,713,075							40,832	71,030	17,805,671
Sequoia National Forest	Federal	19,475	24,455	43,930	43,930															
	Private	9,120	9,760	18,880	18,880															
	Total	28,595	34,215	62,810	62,810															
Total All National Forests	Federal	676,325	322,443	998,768	772,991	225,777	148,758	35,247,844	45,617	24,733	6,866,141	5,941	2,876	215,235	4,716	2,320	141,175	282,051	178,687	42,470,395
	Private	792,387	167,352	959,739	689,349	270,390	152,249	41,180,088	27,248	13,778	1,480,591	960	184	18,453	347	47	1,998	298,945	166,258	42,681,130
	State	5,207	1,100	6,307	3,258	3,049	1,784	332,279	-	-	-	-	-	-	-	-	-	3,049	1,784	332,279
	Total	1,473,919	490,895	1,964,814	1,465,598	499,216	302,791	76,760,211	72,865	38,511	8,346,732	6,901	3,060	233,688	5,063	2,367	143,173	584,045	346,729	85,483,804
NATIONAL PARKS																				
Lassen Volcanic National Park	Federal	2,200	9,320	11,520	6,927	4,593	1,696	171,267										4,593	1,696	171,267
	Private	-	140	140	-	140	55	14,977										140	55	14,977
	Total	2,200	9,460	11,660	6,927	4,733	1,751	186,244										4,733	1,751	186,244
Yosemite National Park	Federal	77,236	43,384	120,620	111,898	8,722	13,604	2,043,418	290	251	64,758							9,012	13,855	2,108,176
	Private	500	2,010	2,510	2,510	-	-	-	-	-	-							-	-	-
	Total	77,736	45,394	123,130	114,408	8,722	13,604	2,043,418	290	251	64,758							9,012	13,855	2,108,176
General Grant National Park	Federal	2,560	-	2,560	757	1,803	1,552	261,064										1,803	1,552	261,064
Sequoia National Park	Federal	40,315	30,965	71,280	71,280															
Total All National Parks	Federal	122,311	83,669	205,980	190,862	15,118	16,852	2,475,749	290	251	64,758							15,408	17,103	2,540,507
	Private	500	2,150	2,650	2,510	140	55	14,977	-	-	-							140	55	14,977
	Total	122,811	85,819	208,630	193,372	15,258	16,907	2,490,726	290	251	64,758							15,548	17,158	2,555,484
STATE PARKS																				
Latour State Park	Private	1,920	80	2,000	2,000															
	State	4,146	4,979	9,125	9,125															
	Total	6,066	5,059	11,125	11,125															
Calaveras Big Trees State Park	Private	120	-	120	-	120	21	3,260	-	-	-							120	21	3,260
	State	1,618	355	1,973	225	1,748	1,318	185,001	215	26	4,792							1,963	1,344	189,793
	Total	1,738	355	2,093	225	1,868	1,339	188,261	215	26	4,792							2,083	1,365	193,053
Total All State Parks	Private	2,040	80	2,120	2,000	120	21	3,260	-	-	-							120	21	3,260
	State	5,764	5,334	11,098	9,350	1,748	1,318	185,001	215	26	4,792							1,963	1,344	189,793
	Total	7,804	5,414	13,218	11,350	1,868	1,339	188,261	215	26	4,792							2,083	1,365	193,053
TOTAL																				
Total All Control Units	Federal	798,636	406,112	1,204,748	963,853	240,895	165,610	37,723,593	45,907	24,984	6,930,899	5,941	2,876	215,235	4,716	2,320	141,175	297,459	195,790	45,010,902
	Private	794,927	169,582	964,509	693,859	270,650	152,325	41,198,325	27,248	13,778	1,480,591	960	184	18,453	347	47	1,998	299,205	166,334	42,699,367
	State	10,971	6,434	17,405	12,608	4,797	3,102	517,280	215	26	4,792	-	-	-	-	-	-	5,012	3,128	522,072
	Total	1,604,534	582,128	2,186,662	1,670,320	516,342	321,037	79,439,198	73,370	38,788	8,416,282	6,901	3,060	233,688	5,063	2,367	143,173	601,676	365,252	**88,232,341

* Includes 8,206 acres of Private and Federal lands in process of acquisition by Yosemite National Park.

** In addition, it is estimated that 79,200, 51,000, and 25,000 Ribes were destroyed in 1934, 1935, and 1937 respectively by slashing and bulldozer work on the Plumas National Forest.

TABLE 1 (CONTINUED)

THE STATUS OF RIBES ERADICATION BY LAND OWNERSHIP IN THE SUGAR PINE REGION AS OF DECEMBER 31, 1938

PART B - OREGON

Control Unit	Class of Ownership	Acreage of Control Units: White and Sugar Pine Type	Non-White and -Sugar Pine Type	Total Acreage	Acreage Unworked	Status of Eradication: First Working: Acres Worked	Man Days	Ribes	Second Working: Acres Worked	Man Days	Ribes	Third Working: Acres Worked	Man Days	Ribes	Fourth Working: Acres Worked	Man Days	Ribes	Total of All Workings: Acres Worked	Man Days	Ribes Eradicated
	NATIONAL FORESTS																			
Rogue River National Forest	Federal: National Forest	75,179	18,794	93,973	38,508	55,465	31,424	12,782,835	20,436	5,397	741,078							75,901	36,821	13,523,913
	Federal: O & C	11,576	2,894	14,470	9,076	5,394	1,154	196,371	-	-	-							5,394	1,154	196,371
	Federal: Total	86,755	21,688	108,443	47,584	60,859	32,578	12,979,206	20,436	5,397	741,078							81,295	37,975	13,720,284
	Private	64,252	16,063	80,315	10,412	69,903	6,902	1,105,988	11,578	1,485	98,465							81,481	8,387	1,204,453
	State	40	-	40	-	40	217	87,560	40	71	16,740							80	288	104,300
	Total	151,047	37,751	188,798	57,996	130,802	39,697	14,172,754	32,054	6,953	856,283							162,856	46,650	15,029,037
Siskiyou National Forest	Federal: National Forest	60,397	10,658	71,055	70,850	205	7	104										205	7	104
	Federal: O & C	81,495	14,381	95,876	95,831	45	1	-										45	1	-
	Federal: Total	141,892	25,039	166,931	166,681	250	8	104										250	8	104
	Private	59,874	10,565	70,439	70,439	-	-	-										-	-	-
	State	689	141	830	830	-	-	-										-	-	-
	Total	202,455	35,745	238,200	237,950	250	8	104										250	8	104
Umpqua National Forest	Federal: National Forest	50,955	12,738	63,693	63,693															
	Federal: O & C	2,752	688	3,440	3,440															
	Federal: Total	53,707	13,426	67,133	67,133															
	Private	6,582	1,645	8,227	8,227															
	State	320	-	320	320															
	Total	60,609	15,071	75,680	75,680															
Siuslaw National Forest	National Forest	140	382	522	-	522	337	119,777	85	66	10,482							607	403	130,259
Mt. Hood National Forest	National Forest	29,016	7,253	36,269	33,620	2,649	1,651	194,292	1,522	939	242,688	244	398	115,168				4,415	2,988	552,148
Total All National Forests	Federal: National Forest	215,687	49,825	265,512	206,671	58,841	33,419	13,097,008	22,043	6,402	994,248	244	398	115,168				81,128	40,219	14,206,424
	Federal: O & C	95,823	17,963	113,786	108,347	5,439	1,155	196,371	-	-	-	-	-	-				5,439	1,155	196,371
	Federal: Total	311,510	67,788	379,298	315,018	64,280	34,574	13,293,379	22,043	6,402	994,248	244	398	115,168				86,567	41,374	14,402,795
	Private	130,708	28,273	158,981	89,078	69,903	6,902	1,105,988	11,578	1,485	98,465	-	-	-				81,481	8,387	1,204,453
	State	1,049	141	1,190	1,150	40	217	87,560	40	71	16,740	-	-	-				80	288	104,300
	Total	443,267	96,202	539,469	405,246	134,223	41,693	14,486,927	33,661	7,958	1,109,453	244	398	115,168				168,128	50,049	15,711,548
	NATIONAL PARKS																			
Crater Lake National Park	National Park	1,295	-	1,295	150	1,145	376	119,913										1,145	376	119,913
	TOTAL																			
Total All Control Units	Federal	312,805	67,788	380,593	315,168	65,425	34,950	13,413,292	22,043	6,402	994,248	244	398	115,168				87,712	41,750	14,522,708
	Private	130,708	28,273	158,981	89,078	69,903	6,902	1,105,988	11,578	1,485	98,465	-	-	-				81,481	8,387	1,204,453
	State	1,049	141	1,190	1,150	40	217	87,560	40	71	16,740	-	-	-				80	288	104,300
	Total	444,562	96,202	540,764	405,396	135,368	42,069	14,606,840	33,661	7,958	1,109,453	244	398	115,168				169,273	50,425	15,831,461

PART C - TOTAL FOR THE REGION

California and Oregon	Federal	1,111,441	473,900	1,585,341	1,279,021	306,320	200,560	51,136,885	67,950	31,386	7,925,147	6,185	3,274	330,403	4,716	2,320	141,175	385,171	237,540	59,533,610
	Private	925,635	197,855	1,123,490	782,937	340,553	159,227	42,304,313	38,826	15,263	1,579,056	960	184	18,453	347	47	1,998	380,686	174,721	43,903,820
	State	12,020	6,575	18,595	13,758	4,837	3,319	604,840	255	97	21,532	-	-	-	-	-	-	5,092	3,416	626,372
	Total	2,049,096	678,330	2,727,426	2,075,716	651,710	363,106	94,046,038	107,031	46,746	9,525,735	7,145	3,458	348,856	5,063	2,367	143,173	770,949	415,677	104,063,802

TABLE 2

SUMMARY OF ALL RIBES ERADICATION IN THE SUGAR PINE REGION, 1938

Type of Funds	Class of Work	Acres Worked	Number 8-Hour Man Days	Total Ribes Eradicated
Bureau of Entomology and Plant Quarantine				
ERA	First Working	37,114	41,909	9,302,388
	Second Working	9,065	4,510	610,758
	Total	46,179	46,419	9,913,146
Forest Service				
ERA	First Working	10,485	17,521	4,331,914
	Second Working	7,782	6,019	3,396,695
	Third Working	1,126	948	53,091
	Fourth Working	745	958	51,861
	Total	20,138	25,446	7,833,561
CCC	First Working	8,725	19,554	2,598,310
	Second Working	12,872	10,726	583,720
	Total	21,597	30,280	3,182,030
Regular	Second Working	8,294	2,654	141,233
Total	First Working	19,210	37,075	6,930,224
	Second Working	28,948	19,399	4,121,648
	Third Working	1,126	948	53,091
	Fourth Working	745	958	51,861
	Total	50,029	58,380	11,156,824
National Park Service				
CCC	First Working	13,055	14,208	1,958,925
	Second Working	290	251	64,758
	Total	13,345	14,459	2,023,683
All Agencies				
Sugar Pine Region	First Working	69,379	93,192	18,191,537
	Second Working	38,303	24,160	4,797,164
	Third Working	1,126	948	53,091
	Fourth Working	745	958	51,861
	Total	109,553	119,258	23,093,653

TABLE 3

SUMMARY OF RIBES ERADICATION BY OPERATIONS FOR CALIFORNIA - 1938

PART A - Initial Work

Agency	Type of Funds	Acres: Worked	Acres: Blocked Out	Acres: Total	Man Hours	Total Ribes Eradicated	Per Acre Worked: 8-Hour Man Days	Per Acre Worked: Ribes	Ownership Status: Acres Covered: Federal	Acres Covered: Private	Acres Covered: Total	Number 8-Hour Man Days: Federal	Number 8-Hour Man Days: Private	Number 8-Hour Man Days: Total	Ribes Eradicated: Federal	Ribes Eradicated: Private	Ribes Eradicated: Total
LASSEN NATIONAL FOREST																	
Bureau	E R A	1,980	-	1,980	22,026	577,192	1.39	292	780	1,200	1,980	907	1,846	2,753	206,206	370,986	577,192
Forest Service	C C C	4,055	-	4,055	36,960	386,005	1.14	95	391	3,664	4,055	354	4,266	4,620	54,259	331,746	386,005
Total - - - - - -		6,035	-	6,035	58,986	963,197	1.22	160	1,171	4,864	6,035	1,261	6,112	7,373	260,465	702,732	963,197
PLUMAS NATIONAL FOREST																	
Bureau	E R A	1,116	-	1,116	22,578	486,740	2.53	436	100	1,016	1,116	301	2,521	2,822	55,877	430,863	486,740
Forest Service	E R A	3,810	35	3,845	51,918	1,048,345	1.70	275	2,728	1,117	3,845	4,856	1,634	6,490	815,704	232,641	1,048,345
	C C C	1,933	243	2,176	39,960	320,364	2.58	166	512	1,664	2,176	546	4,449	4,995	46,723	273,641	320,364
	Total	5,743	278	6,021	91,878	1,368,709	1.99	238	3,240	2,781	6,021	5,402	6,083	11,485	862,427	506,282	1,368,709
Total - - - - - -		6,859	278	7,137	114,456	1,855,449	2.08	271	3,340	3,797	7,137	5,703	8,604	14,307	918,304	937,145	1,855,449
ELDORADO NATIONAL FOREST																	
Bureau	E R A	8,846	200	9,046	85,733	1,466,634	1.21	166	1,214	7,832	9,046	1,474	9,243	10,717	251,647	1,214,987	1,466,634
Forest Service	E R A	2,195	-	2,195	30,954	1,013,959	1.76	462	1,059	1,136	2,195	1,647	2,222	3,869	412,194	601,765	1,013,959
	C C C	1,352	48	1,400	36,216	392,815	3.35	291	860	540	1,400	2,589	1,938	4,527	260,696	132,119	392,815
	Total	3,547	48	3,595	67,170	1,406,774	2.37	397	1,919	1,676	3,595	4,236	4,160	8,396	672,890	733,884	1,406,774
Total - - - - - -		12,393	248	12,641	152,903	2,873,408	1.54	232	3,133	9,508	12,641	5,710	13,403	19,113	924,537	1,948,871	2,873,408
STANISLAUS NATIONAL FOREST																	
Bureau	E R A	3,540	680	4,220	50,736	1,806,416	1.79	510	1,880	2,340	4,220	1,412	4,930	6,342	364,248	1,442,168	1,806,416
Forest Service	E R A	400	-	400	9,498	325,233	2.97	813	400	-	400	1,187	-	1,187	325,233	-	325,233
Total - - - - - -		3,940	680	4,620	60,234	2,131,649	1.91	541	2,280	2,340	4,620	2,599	4,930	7,529	689,481	1,442,168	2,131,649
SIERRA NATIONAL FOREST																	
Bureau	E R A	2,762	-	2,762	52,224	1,444,222	2.36	523	440	2,322	2,762	877	5,651	6,528	160,508	1,283,714	1,444,222
Forest Service	E R A	3,901	144	4,045	47,800	1,944,377	1.53	498	3,109	936	4,045	5,166	809	5,975	1,586,192	358,185	1,944,377
	C C C	1,094	-	1,094	43,296	1,499,126	4.95	1,370	1,094	-	1,094	5,412	-	5,412	1,499,126	-	1,499,126
	Total	4,995	144	5,139	91,096	3,443,503	2.28	689	4,203	936	5,139	10,578	809	11,387	3,085,318	358,185	3,443,503
Total - - - - - -		7,757	144	7,901	143,320	4,887,725	2.31	630	4,643	3,258	7,901	11,455	6,460	17,915	3,245,826	1,641,899	4,887,725
NATIONAL FOREST TOTALS																	
Bureau	E R A	18,244	880	19,124	233,297	5,781,204	1.60	317	4,414	14,710	19,124	4,971	24,191	29,162	1,038,486	4,742,718	5,781,204
Forest Service	E R A	10,306	179	10,485	140,170	4,331,914	1.70	420	7,296	3,189	10,485	12,856	4,665	17,521	3,139,323	1,192,591	4,331,914
	C C C	8,434	291	8,725	156,432	2,598,310	2.32	308	2,857	5,868	8,725	8,901	10,653	19,554	1,860,804	737,506	2,598,310
	Total	18,740	470	19,210	296,602	6,930,224	1.98	370	10,153	9,057	19,210	21,757	15,318	37,075	5,000,127	1,930,097	6,930,224
Total - - - - - -		36,984	1,350	38,334	529,899	12,711,428	1.79	344	14,567	23,767	38,334	26,728	39,509	66,237	6,038,613	6,672,815	12,711,428
NATIONAL PARKS																	
Lassen	C C C	1,799	2,934	4,733	14,010	186,244	0.97	104	4,593	140	4,733	1,696	55	1,751	171,267	14,977	186,244
Yosemite	C C C	6,054	465	6,519	87,240	1,511,617	1.80	250	6,519	-	6,519	10,905	-	10,905	1,511,617	-	1,511,617
General Grant	C C C	1,803	-	1,803	12,417	261,064	0.86	145	1,803	-	1,803	1,552	-	1,552	261,064	-	261,064
Total - - - - - -		9,656	3,399	13,055	113,667	1,958,925	1.47	202	12,915	140	13,055	14,153	55	14,208	1,943,948	14,977	1,958,925
CALIFORNIA TOTALS																	
All Agencies	E R A	28,550	1,059	29,609	373,467	10,113,118	1.63	354	11,710	17,899	29,609	17,827	28,856	46,683	4,177,809	5,935,309	10,113,118
	C C C	18,090	3,690	21,780	270,099	4,557,235	1.86	251	15,772	6,008	21,780	23,054	10,708	33,762	3,804,752	752,483	4,557,235
Total - - - - - -		46,640	4,749	51,389	643,566	14,670,353	1.72	314	27,482	23,907	51,389	40,881	39,564	80,445	7,982,561	6,687,792	14,670,353

TABLE 3 (CONTINUED)

SUMMARY OF RIBES ERADICATION BY OPERATIONS FOR CALIFORNIA - 1938

PART B - Reeradication

Agency	Type of Funds	Class of Work	Acres Worked	Man Hours	Total Ribes Eradicated	Per Acre Worked: 8-Hour Man Days	Per Acre Worked: Ribes	Acres Covered: Federal	Acres Covered: Private	Acres Covered: Total	Number 8-Hour Man Days: Federal	Number 8-Hour Man Days: Private	Number 8-Hour Man Days: Total	Ribes Eradicated: Federal	Ribes Eradicated: Private	Ribes Eradicated: Total	Acreage Ribes-free at Time of Re-eradication
LASSEN NATIONAL FOREST																	
Bureau	E R A	Second Working	1,860	2,586	11,598	0.17	6	717	1,143	1,860	114	209	323	4,448	7,150	11,598	5,180
Forest Service	C C C	Second Working	4,489	17,850	198,485	0.50	44	622	3,867	4,489	261	1,970	2,231	5,014	193,471	198,485	5,811
Total All Workings - - - - - - -			6,349	20,436	210,083	0.40	33	1,339	5,010	6,349	375	2,179	2,554	9,462	200,621	210,083	10,991
PLUMAS NATIONAL FOREST																	
Forest Service	C C C	Second Working	443	1,854	11,951	0.52	27	135	308	443	44	188	232	691	11,260	11,951	517
STANISLAUS NATIONAL FOREST																	
Forest Service	E R A	Second Working	1,401	10,356	109,502	0.92	78	933	468	1,401	1,024	271	1,295	94,972	14,530	109,502	167
		Third Working	1,126	7,580	53,091	0.84	47	1,126	-	1,126	948	-	948	53,091	-	53,091	90
		Fourth Working	745	7,660	51,861	1.29	70	745	-	745	958	-	958	51,861	-	51,861	-
		Total	3,272	25,596	214,454	0.98	66	2,804	468	3,272	2,930	271	3,201	199,924	14,530	214,454	257
	C C C	Second Working	6,590	56,778	170,984	1.08	26	1,660	4,930	6,590	1,822	5,275	7,097	46,550	124,434	170,984	975
	Regular	Second Working	8,294	21,235	141,233	0.32	17	6,134	2,160	8,294	1,956	698	2,654	92,810	48,423	141,233	5,151
	All Funds	Second Working	16,285	88,369	421,719	0.68	26	8,727	7,558	16,285	4,802	6,244	11,046	234,332	187,387	421,719	6,293
		Third Working	1,126	7,580	53,091	0.84	47	1,126	-	1,126	948	-	948	53,091	-	53,091	90
		Fourth Working	745	7,660	51,861	1.29	70	745	-	745	958	-	958	51,861	-	51,861	-
Total All Workings - - - - - - -			18,156	103,609	526,671	0.71	29	10,598	7,558	18,156	6,708	6,244	12,952	339,284	187,387	526,671	6,383
SIERRA NATIONAL FOREST																	
Bureau	E R A	Second Working	1,185	11,370	223,582	1.20	189	885	300	1,185	1,003	418	1,421	163,997	59,585	223,582	-
Forest Service	E R A	Second Working	6,381	37,794	3,287,193	0.74	515	6,341	40	6,381	4,704	20	4,724	3,280,657	6,536	3,287,193	-
	C C C	Second Working	1,350	9,324	202,300	0.86	150	1,350	-	1,350	1,166	-	1,166	202,300	-	202,300	-
	Total		7,731	47,118	3,489,493	0.76	451	7,691	40	7,731	5,870	20	5,890	3,482,957	6,536	3,489,493	-
Total All Workings - - - - - - -			8,916	58,488	3,713,075	0.82	416	8,576	340	8,916	6,873	438	7,311	3,646,954	66,121	3,713,075	-
NATIONAL FOREST TOTALS																	
Bureau	E R A	Second Working	3,045	13,956	235,180	0.57	77	1,602	1,443	3,045	1,117	627	1,744	168,445	66,735	235,180	5,180
Forest Service	E R A	Second Working	7,782	48,150	3,396,695	0.77	436	7,274	508	7,782	5,728	291	6,019	3,375,629	21,066	3,396,695	167
		Third Working	1,126	7,580	53,091	0.84	47	1,126	-	1,126	948	-	948	53,091	-	53,091	90
		Fourth Working	745	7,660	51,861	1.29	70	745	-	745	958	-	958	51,861	-	51,861	-
		Total	9,653	63,390	3,501,647	0.82	363	9,145	508	9,653	7,634	291	7,925	3,480,581	21,066	3,501,647	257
	C C C	Second Working	12,872	85,806	583,720	0.83	45	3,767	9,105	12,872	3,293	7,433	10,726	254,555	329,165	583,720	7,303
	Regular	Second Working	8,294	21,235	141,233	0.32	17	6,134	2,160	8,294	1,956	698	2,654	92,810	48,423	141,233	5,151
	All Funds	Second Working	28,948	155,191	4,121,648	0.67	142	17,175	11,773	28,948	10,977	8,422	19,399	3,722,994	398,654	4,121,648	12,621
		Third Working	1,126	7,580	53,091	0.84	47	1,126	-	1,126	948	-	948	53,091	-	53,091	90
		Fourth Working	745	7,660	51,861	1.29	70	745	-	745	958	-	958	51,861	-	51,861	-
		Total	30,819	170,431	4,226,600	0.69	137	19,046	11,773	30,819	12,883	8,422	21,305	3,827,946	398,654	4,226,600	12,711
Bureau and Forest Service Totals For All Funds		Second Working	31,993	169,147	4,356,828	0.66	136	18,777	13,216	31,993	12,094	9,049	21,143	3,891,439	465,389	4,356,828	17,801
		Third Working	1,126	7,580	53,091	0.84	47	1,126	-	1,126	948	-	948	53,091	-	53,091	90
		Fourth Working	745	7,660	51,861	1.29	70	745	-	745	958	-	958	51,861	-	51,861	-
Total All Workings - - - - - - -			33,864	184,387	4,461,780	0.68	132	20,648	13,216	33,864	14,000	9,049	23,049	3,996,391	465,389	4,461,780	17,891
YOSEMITE NATIONAL PARK																	
National Park Service	C C C	Second Working	290	2,010	64,758	0.87	223	290	-	290	251	-	251	64,758	-	64,758	45
CALIFORNIA TOTALS																	
All Agencies	E R A	Second Working	10,827	62,106	3,631,875	0.72	335	8,876	1,951	10,827	6,845	918	7,763	3,544,074	87,801	3,631,875	5,347
		Third Working	1,126	7,580	53,091	0.84	47	1,126	-	1,126	948	-	948	53,091	-	53,091	90
		Fourth Working	745	7,660	51,861	1.29	70	745	-	745	958	-	958	51,861	-	51,861	-
		Total	12,698	77,346	3,736,827	0.76	294	10,747	1,951	12,698	8,751	918	9,669	3,649,026	87,801	3,736,827	5,437
	C C C	Second Working	13,162	87,816	648,478	0.83	49	4,057	9,105	13,162	3,544	7,433	10,977	319,313	329,165	648,478	7,348
	Regular	Second Working	8,294	21,235	141,233	0.32	17	6,134	2,160	8,294	1,956	698	2,654	92,810	48,423	141,233	5,151
	All Funds	Second Working	32,283	171,157	4,421,586	0.66	137	19,067	13,216	32,283	12,345	9,049	21,394	3,956,197	465,389	4,421,586	17,846
		Third Working	1,126	7,580	53,091	0.84	47	1,126	-	1,126	948	-	948	53,091	-	53,091	90
		Fourth Working	745	7,660	51,861	1.29	70	745	-	745	958	-	958	51,861	-	51,861	-
Total All Workings - - - - - - -			34,154	186,397	4,526,538	0.68	133	20,938	13,216	34,154	14,251	9,049	23,300	4,061,149	465,389	4,526,538	17,936

TABLE 3 (CONCLUDED)

SUMMARY OF RIBES ERADICATION BY OPERATIONS FOR CALIFORNIA - 1938

PART C - All Workings

Agency	Type of Funds	Acres Worked*	Man Hours	Total Ribes Eradicated	Per Acre Worked: 8-Hour Man Days	Per Acre Worked: Ribes	Acres Covered: Federal	Acres Covered: Private	Acres Covered: Total	Number 8-Hour Man Days: Federal	Number 8-Hour Man Days: Private	Number 8-Hour Man Days: Total	Ribes Eradicated: Federal	Ribes Eradicated: Private	Ribes Eradicated: Total
LASSEN NATIONAL FOREST															
Bureau	E R A	3,840	24,612	588,790	0.80	153	1,497	2,343	3,840	1,021	2,055	3,076	210,654	378,136	588,790
Forest Service	C C C	8,544	54,810	584,490	0.80	68	1,013	7,531	8,544	615	6,236	6,851	59,273	525,217	584,490
Total - - - - - -		12,384	79,422	1,173,280	0.80	95	2,510	9,874	12,384	1,636	8,291	9,927	269,927	903,353	1,173,280
PLUMAS NATIONAL FOREST															
Bureau	E R A	1,116	22,578	486,740	2.53	436	100	1,016	1,116	301	2,521	2,822	55,877	430,863	486,740
Forest Service	E R A	3,845	51,918	1,048,345	1.69	273	2,728	1,117	3,845	4,856	1,634	6,490	815,704	232,641	1,048,345
	C C C	2,619	41,814	332,315	2.00	127	647	1,972	2,619	590	4,637	5,227	47,414	284,901	332,315
	Total	6,464	93,732	1,380,660	1.81	214	3,375	3,089	6,464	5,446	6,271	11,717	863,118	517,542	1,380,660
Total - - - - - -		7,580	116,310	1,867,400	1.92	246	3,475	4,105	7,580	5,747	8,792	14,539	918,995	948,405	1,867,400
ELDORADO NATIONAL FOREST															
Bureau	E R A	9,046	85,733	1,466,634	1.18	162	1,214	7,832	9,046	1,474	9,243	10,717	251,647	1,214,987	1,466,634
Forest Service	E R A	2,195	30,954	1,013,959	1.76	462	1,059	1,136	2,195	1,647	2,222	3,869	412,194	601,765	1,013,959
	C C C	1,400	36,216	392,815	3.23	281	860	540	1,400	2,589	1,938	4,527	260,696	132,119	392,815
	Total	3,595	67,170	1,406,774	2.34	391	1,919	1,676	3,595	4,236	4,160	8,396	672,890	733,884	1,406,774
Total - - - - - -		12,641	152,903	2,873,408	1.51	227	3,133	9,508	12,641	5,710	13,403	19,113	924,537	1,948,871	2,873,408
STANISLAUS NATIONAL FOREST															
Bureau	E R A	4,220	50,736	1,806,416	1.50	428	1,880	2,340	4,220	1,412	4,930	6,342	364,248	1,442,168	1,806,416
Forest Service	E R A	3,672	35,094	539,687	1.19	147	3,204	468	3,672	4,117	271	4,388	525,157	14,530	539,687
	C C C	6,590	56,778	170,984	1.08	26	1,660	4,930	6,590	1,822	5,275	7,097	46,550	124,434	170,984
	Regular	8,294	21,235	141,233	0.32	17	6,134	2,160	8,294	1,956	698	2,654	92,810	48,423	141,233
	Total	18,556	113,107	851,904	0.76	46	10,998	7,558	18,556	7,895	6,244	14,139	664,517	187,387	851,904
Total - - - - - -		22,776	163,843	2,658,320	0.90	117	12,878	9,898	22,776	9,307	11,174	20,481	1,028,765	1,629,555	2,658,320
SIERRA NATIONAL FOREST															
Bureau	E R A	3,947	63,594	1,667,804	2.01	423	1,325	2,622	3,947	1,880	6,069	7,949	324,505	1,343,299	1,667,804
Forest Service	E R A	10,426	85,594	5,231,570	1.03	502	9,450	976	10,426	9,870	829	10,699	4,866,849	364,721	5,231,570
	C C C	2,444	52,620	1,701,426	2.69	696	2,444	-	2,444	6,578	-	6,578	1,701,426	-	1,701,426
	Total	12,870	138,214	6,932,996	1.34	539	11,894	976	12,870	16,448	829	17,277	6,568,275	364,721	6,932,996
Total - - - - - -		16,817	201,808	8,600,800	1.50	511	13,219	3,598	16,817	18,328	6,898	25,226	6,892,780	1,708,020	8,600,800
NATIONAL FOREST TOTALS															
Bureau	E R A	22,169	247,253	6,016,384	1.39	271	6,016	16,153	22,169	6,088	24,818	30,906	1,206,931	4,809,453	6,016,384
Forest Service	E R A	20,138	203,560	7,833,561	1.26	389	16,441	3,697	20,138	20,490	4,956	25,446	6,619,904	1,213,657	7,833,561
	C C C	21,597	242,238	3,182,030	1.40	147	6,624	14,973	21,597	12,194	18,086	30,280	2,115,359	1,066,671	3,182,030
	Regular	8,294	21,235	141,233	0.32	17	6,134	2,160	8,294	1,956	698	2,654	92,810	48,423	141,233
	Total	50,029	467,033	11,156,824	1.17	223	29,199	20,830	50,029	34,640	23,740	58,380	8,828,073	2,328,751	11,156,824
Total - - - - - -		72,198	714,286	17,173,208	1.24	238	35,215	36,983	72,198	40,728	48,558	89,286	10,035,004	7,138,204	17,173,208
NATIONAL PARKS															
Lassen	C C C	4,733	14,010	186,244	0.37	39	4,593	140	4,733	1,696	55	1,751	171,267	14,977	186,244
Yosemite	C C C	6,809	89,250	1,576,375	1.64	232	6,809	-	6,809	11,156	-	11,156	1,576,375	-	1,576,375
General Grant	C C C	1,803	12,417	261,064	0.86	145	1,803	-	1,803	1,552	-	1,552	261,064	-	261,064
Total - - - - - -		13,345	115,677	2,023,683	1.08	152	13,205	140	13,345	14,404	55	14,459	2,008,706	14,977	2,023,683
CALIFORNIA TOTALS															
All Agencies	E R A	42,307	450,813	13,849,945	1.33	327	22,457	19,850	42,307	26,578	29,774	56,352	7,826,835	6,023,110	13,849,945
	C C C	34,942	357,915	5,205,713	1.28	149	19,829	15,113	34,942	26,598	18,141	44,739	4,124,065	1,081,648	5,205,713
	Regular	8,294	21,235	141,233	0.32	17	6,134	2,160	8,294	1,956	698	2,654	92,810	48,423	141,233
Total - - - - - -		85,543	829,963	19,196,891	1.21	224	48,420	37,123	85,543	55,132	48,613	103,745	12,043,710	7,153,181	19,196,891

* Includes worked and blocked-out acres on initial eradication, but only acres worked on all subsequent eradications.

TABLE 4

SUMMARY OF RIBES ERADICATION FOR OREGON, 1938

Agency and Type of Funds	Class of Work	Acres			Man Hours	Total Ribes Eradicated	Per Acre Worked		Ownership Status												Acreage Ribes-free at Time of Re-eradication
									Acres Covered				Number 8-Hour Man Days				Ribes Eradicated				
		Worked	Blocked Out	Total			8-Hour Man Days	Ribes	Federal* National Forest	State	Private	Total	Federal* National Forest	State	Private	Total	Federal* National Forest	State	Private	Total	
Bureau ERA	First Working	12,301	5,689	17,990	101,976	3,521,184	1.04	286	16,784	-	1,206	17,990	12,325	-	422	12,747	3,484,398	-	36,786	3,521,184	-
	Second Working	6,020	-	6,020	22,128	375,578	0.46	62	4,817	40	1,163	6,020	2,145	71	550	2,766	327,572	16,740	31,266	375,578	8,191
	Total - -	18,321	5,689	24,010	124,104	3,896,762	0.64	162	21,601	40	2,369	24,010	14,470	71	972	15,513	3,811,970	16,740	68,052	3,896,762	8,191

* No O and C lands worked during 1938.

TABLE 5

RIBES ERADICATED BY SPECIES - CALIFORNIA, 1938

Agency	Class of Work	Ribes roezli	Ribes nevadense	Ribes viscosissimum	Ribes cereum	Ribes inerme	Ribes montigenum	Ribes amarum	Total Ribes Eradicated
Lassen National Forest	First Working	770,318	71,047	6,007	40	115,785			963,197
	Second Working	167,297	11,739	173	2	30,872			210,083
	Total	937,615	82,786	6,180	42	146,657			1,173,280
Plumas National Forest	First Working	1,503,173	292,204	13,586	-	42,071			1,851,034
	Second Working	10,208	3,907	357	-	1,894			16,366
	Total	1,513,381	296,111	13,943	-	43,965			1,867,400
Eldorado National Forest	First Working	2,419,427	61,025	141	-	-			2,480,593
Stanislaus National Forest	First Working	1,997,081	19,199	104,183	11,186	-			2,131,649
	Second Working	378,903	32,923	9,148	745	-			421,719
	Third Working	47,028	6,035	28	-	-			53,091
	Fourth Working	43,215	7,487	1,124	35	-			51,861
	Total	2,466,227	65,644	114,483	11,966	-			2,658,320
Sierra National Forest	First Working	4,568,425	224,787	-	22	-		94,491	4,887,725
	Second Working	3,590,357	121,638	-	1,080	-		-	3,713,075
	Total	8,158,782	346,425	-	1,102	-		94,491	8,600,800
Lassen National Park	First Working	33,564	34	5,991	44,988	-	101,667	-	186,244
Yosemite National Park	First Working	1,377,275	134,342	-	-	-	-	-	1,511,617
	Second Working	62,327	2,431	-	-	-	-	-	64,758
	Total	1,439,602	136,773	-	-	-	-	-	1,576,375
General Grant National Park	First Working	108,390	127,112	20,932	4,630	-	-	-	261,064
Total All Agencies	First Working	12,777,653	929,750	150,840	60,866	157,856	101,667	94,491	14,273,123
	Second Working	4,209,092	172,638	9,678	1,827	32,766	-	-	4,426,001
	Third Working	47,028	6,035	28	-	-	-	-	53,091
	Fourth Working	43,215	7,487	1,124	35	-	-	-	51,861
	Total	17,076,988	1,115,910	161,670	62,728	190,622	101,667	94,491	18,804,076

TABLE 6

RIBES ERADICATED BY SPECIES - OREGON, 1938

Agency	Class of Work	Ribes binominatum	Ribes bracteosum	Ribes cereum	Ribes cruentum	Ribes erythrocarpum	Ribes klamathense	Ribes lacustre	Ribes lobbii	Ribes sanguineum	Ribes triste	Ribes viscosissimum	Total Ribes Eradicated
Rogue River National Forest	First Working	1,191,117	36,499	416,593	90,608	25,651	2,885	811,949	288,976	257,567	42	399,297	3,521,184
	Second Working	152,069	1,471	9,020	13,097	7,947	14,629	84,897	34,968	29,557	-	27,923	375,578
	Total	1,343,186	37,970	425,613	103,705	33,598	17,514	896,846	323,944	287,124	42	427,220	3,896,762

TABLE 7

THE DISTRIBUTION OF CAMPS BY OPERATION AND COUNTY IN THE SUGAR PINE REGION DURING 1938

Control Unit	Agency and Fund	County	Number and Average Size of Camps	Approximate Period of Operation	Location
Rogue River National Forest	EQ - ERA	Jackson	2 150-Man 2 70-Man	May 1 - Oct. 15	Bear Camp, Union Creek, Kiter Creek and Buck Basin
Lassen National Forest	EQ - ERA	Tehama	1 100-Man	June 15 - Sept. 30	Gurnsey Creek
	FS - CCC	Tehama	1 100-Man 1 150-Man	June 10 - Oct. 20	Deer Creek and Soda Springs
Plumas National Forest	EQ - ERA	Plumas	1 100-Man	June 20 - Sept. 15	Prattville
	FS - ERA	Plumas	3 100-Man	June 15 - Sept. 30	Muggins Creek, Drill Camp and Mosquito Ridge
	FS - CCC	Plumas	1 100-Man 1 25-Man	June 15 - Oct. 15	Humbug and Meadow Valley
Eldorado National Forest	EQ - ERA	El Dorado	3 100-Man	June 1 - Sept. 15	Butchers Corral, Jackson Springs and Davis Cabin
	FS - ERA	Placer	1 100-Man	June 1 - Sept. 30	Goggins Mine
	FS - CCC	El Dorado	1 100-Man	May 15 - Sept. 30	Caldor
Stanislaus National Forest	EQ - ERA	Tuolumne	1 150-Man	May 25 - Sept. 30	Thompson Meadows
	FS - ERA	Tuolumne	1 100-Man	June 4 - Oct. 13	Cow Creek
	FS - CCC	Tuolumne	1 25-Man 1 125-Man	June 1 - Oct. 10	Skull Creek and Buck Meadows
	FS - Regular	Tuolumne	2 30-Man	July 25 - Oct. 10	Dry Meadows and Smoothwire Creek
Sierra National Forest	EQ - ERA	Mariposa	1 150-Man	May 20 - Nov. 3	Miami Creek
	FS - ERA	Mariposa	2 150-Man	June 1 - Sept. 30	Signal Peak and Summit
	FS - CCC	Madera	1 100-Man	June 15 - Oct. 15	Soquel
Lassen Volcanic National Park	NPS - CCC	Tehama	1 20-Man	Aug.10 - Sept. 10	Mineral
	NPS - CCC	Shasta	1 45-Man	July 1 - Sept. 15	Old Boundary Springs
Yosemite National Park	NPS - CCC	Tuolumne	1 100-Man 1 50-Man	June 15 - Oct. 15	Middle Fork and Crane Flat
	NPS - CCC	Mariposa	2 40-Man	April 25 - Oct. 31	Wawona and Merced Grove
General Grant National Park	NPS - CCC	Fresno	1 40-Man	June 15 - Oct. 10	General Grant National Park

TABLE 8

ADJUSTED STATEMENT OF COST FOR THE SUGAR PINE REGION RIBES ERADICATION PROJECT - 1938

Agency		Classification of Expenditures	Sugar Pine Region WPA Camps: Lassen and Plumas	Eldorado	Stanislaus	Sierra	Sub-Total	Oregon	Total Sugar Pine Region	Forest Service Regular Camps
Bureau of Entomology and Plant Quarantine		Salaries - Permanent Personnel	$ 3,199.92	$ 5,803.81	$ 5,862.39	$ 3,362.99	$ 18,229.11	$ 7,666.77	$ 25,895.88	
		Wages - Temporary Personnel	27,998.94	46,795.37	25,386.58	40,351.23	140,532.12	72,332.47	212,864.59	
		Equipment	1,653.92	1,067.87	1,850.00	1,123.80	5,695.59	2,527.45	8,223.04	
		Subsistence Supplies	9,796.33	17,766.26	9,862.57	15,838.63	53,263.79	22,482.29	75,746.08	
		Other Supplies and Expenses	1,757.82	2,497.19	1,071.25	1,679.23	7,005.49	3,747.53	10,753.02	
		Transportation and Travel	3,091.71	3,531.14	2,282.94	2,986.32	11,892.11	2,476.34	14,368.45	
		Gross Distributed Expenditures	47,498.64	77,461.64	46,315.73	65,342.20	236,618.21	111,232.85	347,851.06	
	Plus	Twine Furnished from Stock	14.66	-	-	-	14.66	-	14.66	
		Subsistence Supplies from Stock	-	543.52	268.91	2,294.22	3,106.65	609.74	3,716.39	
		Depreciation on Equipment	1,365.78	2,048.67	1,365.78	1,024.34	5,804.57	2,731.56	8,536.13	
		Total Charges	48,879.08	80,053.83	47,950.42	68,660.76	245,544.09	114,574.15	360,118.24	
	Less	Non Eradication Charges:								
		Salaries - Permanent Personnel	3,199.92	5,803.81	5,862.39	3,362.99	18,229.11	7,666.77	25,895.88	
		Equipment	1,653.92	1,067.87	1,850.00	1,123.80	5,695.59	2,527.45	8,223.04	
		Twine Returned to Stock	-	319.90	469.40	374.43	1,163.73	637.17	1,800.90	
		Subsistence Supplies Returned	-	938.82	-	2,206.51	3,145.33	1,024.31	4,169.64	
		Operation Winter Camp	-	-	-	19,390.54	19,390.54	4,337.00	23,727.54	
		Total Deductions	4,853.84	8,130.40	8,181.79	26,458.27	47,624.30	16,192.70	63,817.00	
		Net Cost - 1938 Operations	44,025.24	71,923.43	39,768.63	42,202.49	197,919.79	98,381.45	296,301.24	
Forest Service		Salaries - Permanent Personnel	3,470.00	-	-	1,807.81	5,277.81		5,277.81	$ 1,444.39
		Wages - Temporary Personnel	35,440.77	16,906.86	16,293.93	48,059.50	116,701.06		116,701.06	12,871.50
		Equipment	5,877.66	1,123.50	59.04	1,112.67	8,172.87		8,172.87	-
		Subsistence Supplies	13,028.01	6,796.72	7,020.14	13,650.86	40,495.73		40,495.73	3,285.47
		Other Supplies and Expenses	2,978.34	1,723.30	320.25	1,728.20	6,750.09		6,750.09	739.32
		Transportation and Travel	3,368.49	1,136.83	915.31	2,389.06	7,809.69		7,809.69	588.70
		Gross Distributed Expenditures	64,163.27	27,687.21	24,608.67	68,748.10	185,207.25		185,207.25	18,929.38
	Plus	Twine Furnished from Stock*	80.60	80.60	80.60	241.80	483.60		483.60	-
		Subsistence Supplies from Stock	-	203.07	-	-	203.07		203.07	-
		Depreciation on Equipment	2,531.22	679.12	327.63	1,378.56	4,916.53		4,916.53	***
		Total Charges	66,775.09	28,650.00	25,016.90	70,368.46	190,810.45		190,810.45	18,929.38
	Less	Non Eradication Charges:								
		Salaries - Permanent Personnel	3,470.00	-	-	1,807.81	5,277.81		5,277.81	1,444.39
		Equipment	5,877.66	1,123.50	59.04	1,112.67	8,172.87		8,172.87	-
		Twine Returned to Stock	150.00	140.00	-	100.00	390.00		390.00	400.00
		Subsistence Supplies Returned	3,075.00	369.06	-	**241.69	3,685.75		3,685.75	-
		Total Deductions	12,572.66	1,632.56	59.04	3,262.17	17,526.43		17,526.43	1,844.39
		Net Cost - 1938 Operation	54,202.43	27,017.44	24,957.86	67,106.29	173,284.02		173,284.02	17,084.99
Total All Agencies		Net Cost	$98,227.67	$98,940.87	$64,726.49	$109,308.78	$371,203.81	$98,381.45	$469,585.26	$17,084.99

* Twine issued from Bureau warehouse beginning of season.

** Food supplies purchased by the Bureau from the Forest Service.

*** Equipment borrowed from the Bureau and the depreciation is carried under Stanislaus Bureau ERA Camp.

TABLE 9

MEAL COST FOR THE RIBES ERADICATION PROJECT OF THE SUGAR PINE REGION – 1938

Agency	Item	ERA Camps						Regular Fund Camps
		Plumas and Lassen	Eldorado	Stanislaus	Sierra	Rogue River	Total Costs	Stanislaus
Bureau	Food	$ 9,796.33	$17,370.96	$10,131.48	$ 8,403.99	$21,457.98	$67,160.74	
	Kitchen Help	2,996.89	4,514.20	2,225.64	3,536.61	9,513.25	22,786.59	
	Total Costs	$12,793.22	$21,885.16	$12,357.12	$11,940.60	$30,971.23	$89,947.33	
	Number Meals Served	53,308	88,683	52,301	69,842	103,369	367,503	
	Average Cost Per Meal	$0.240	$0.247	$0.236	$0.171	$0.300	$0.245	
Forest Service	Food	$ 9,953.01	$ 6,630.73	$ 7,020.14	$13,409.17	-	$37,013.05	$ 3,285.47
	Kitchen Help	2,946.51	1,888.98	1,794.90	4,117.22	-	10,747.61	1,185.16
	Total Costs	$12,899.52	$ 8,519.71	$ 8,815.04	$17,526.39	-	$47,760.66	$ 4,470.63
	Number Meals Served	54,108	31,901	33,395	75,759	-	195,163	14,767
	Average Cost Per Meal	$0.238	$0.267	$0.264	$0.231	-	$0.245	$0.303

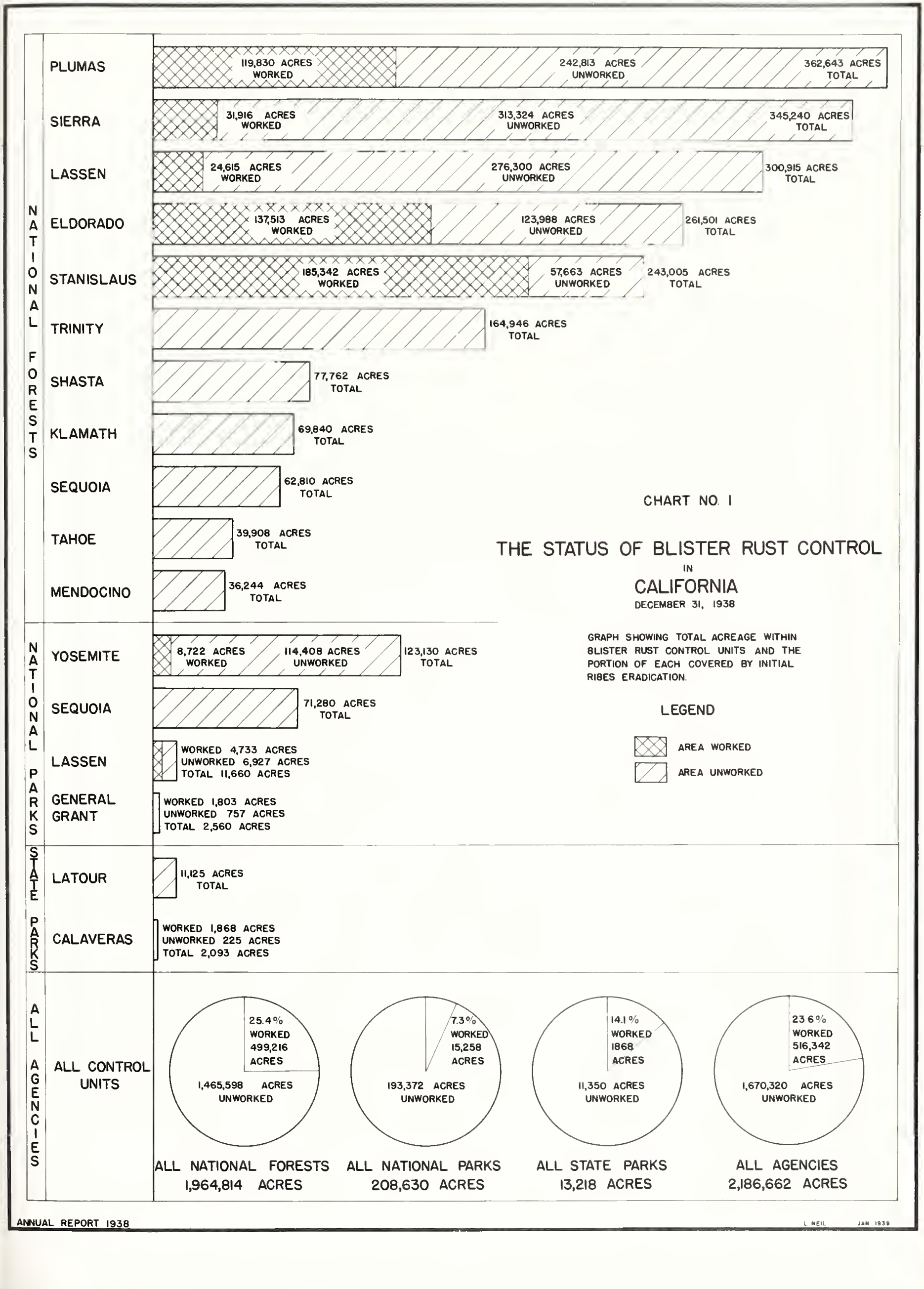


CHART NO. I
THE STATUS OF BLISTER RUST CONTROL
IN
CALIFORNIA
DECEMBER 31, 1938
GRAPH SHOWING TOTAL ACREAGE WITHIN BLISTER RUST CONTROL UNITS AND THE PORTION OF EACH COVERED BY INITIAL RIBES ERADICATION.
LEGEND
AREA WORKED
AREA UNWORKED
NATIONAL FORESTS
PLUMAS
119,830 ACRES WORKED
242,813 ACRES UNWORKED
362,643 ACRES TOTAL
SIERRA
31,916 ACRES WORKED
313,324 ACRES UNWORKED
345,240 ACRES TOTAL
LASSEN
24,615 ACRES WORKED
276,300 ACRES UNWORKED
300,915 ACRES TOTAL
ELDORADO
137,513 ACRES WORKED
123,988 ACRES UNWORKED
261,501 ACRES TOTAL
STANISLAUS
185,342 ACRES WORKED
57,663 ACRES UNWORKED
243,005 ACRES TOTAL
TRINITY
164,946 ACRES TOTAL
SHASTA
77,762 ACRES TOTAL
KLAMATH
69,840 ACRES TOTAL
SEQUOIA
62,810 ACRES TOTAL
TAHOE
39,908 ACRES TOTAL
MENDOCINO
36,244 ACRES TOTAL
NATIONAL PARKS
YOSEMITE
8,722 ACRES WORKED
114,408 ACRES UNWORKED
123,130 ACRES TOTAL
SEQUOIA
71,280 ACRES TOTAL
LASSEN
WORKED 4,733 ACRES
UNWORKED 6,927 ACRES
TOTAL 11,660 ACRES
GENERAL GRANT
WORKED 1,803 ACRES
UNWORKED 757 ACRES
TOTAL 2,560 ACRES
STATE PARKS
LATOUR
11,125 ACRES TOTAL
CALAVERAS
WORKED 1,868 ACRES
UNWORKED 225 ACRES
TOTAL 2,093 ACRES
ALL AGENCIES
ALL CONTROL UNITS
25.4% WORKED 499,216 ACRES
1,465,598 ACRES UNWORKED
ALL NATIONAL FORESTS 1,964,814 ACRES
7.3% WORKED 15,258 ACRES
193,372 ACRES UNWORKED
ALL NATIONAL PARKS 208,630 ACRES
14.1% WORKED 1868 ACRES
11,350 ACRES UNWORKED
ALL STATE PARKS 13,218 ACRES
23.6% WORKED 516,342 ACRES
1,670,320 ACRES UNWORKED
ALL AGENCIES 2,186,662 ACRES
ANNUAL REPORT 1938
L NEIL JAN 1939

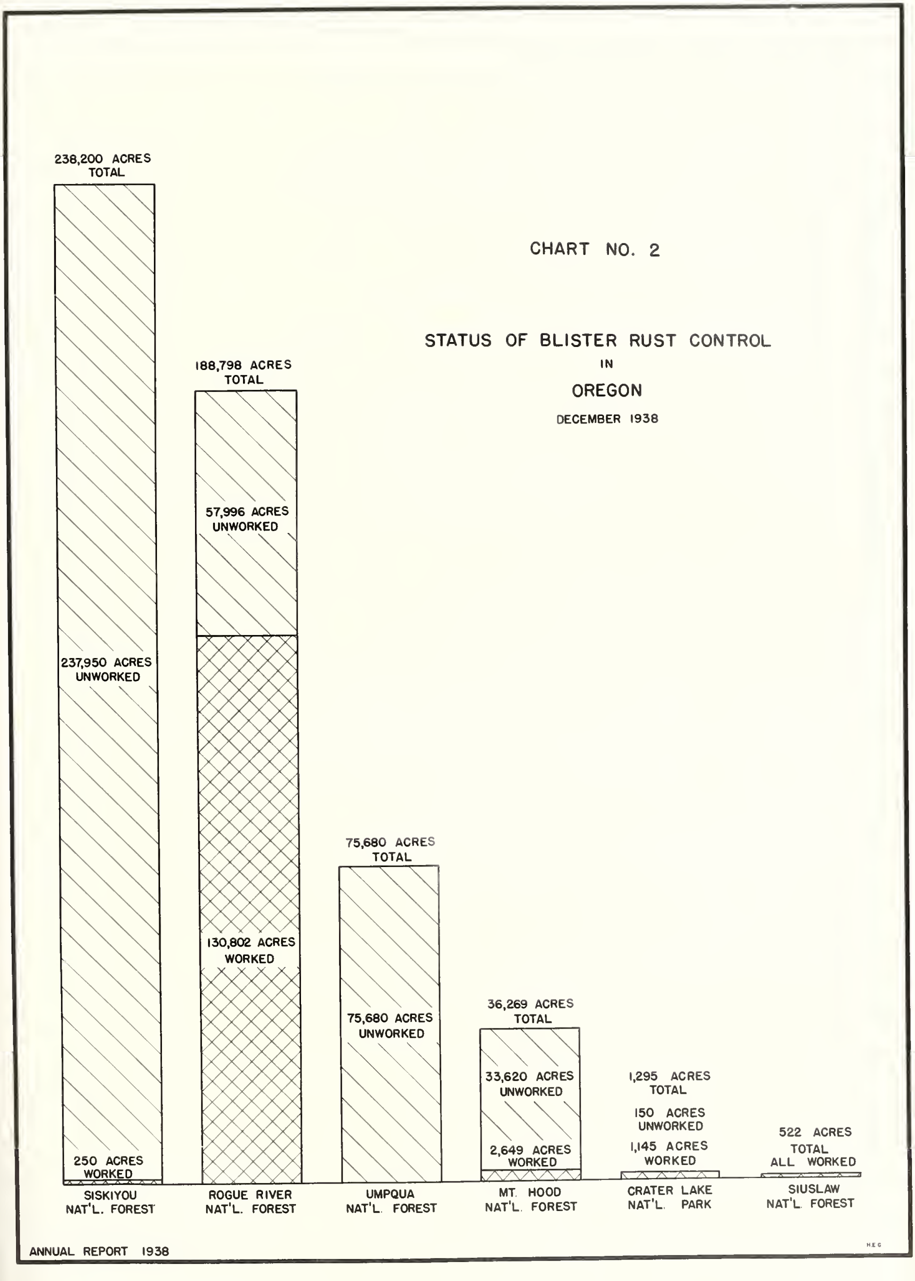


CHART NO. 2
STATUS OF BLISTER RUST CONTROL
IN
OREGON
DECEMBER 1938
238,200 ACRES TOTAL
237,950 ACRES UNWORKED
250 ACRES WORKED
SISKIYOU NAT'L. FOREST
188,798 ACRES TOTAL
57,996 ACRES UNWORKED
130,802 ACRES WORKED
ROGUE RIVER NAT'L. FOREST
75,680 ACRES TOTAL
75,680 ACRES UNWORKED
UMPQUA NAT'L. FOREST
36,269 ACRES TOTAL
33,620 ACRES UNWORKED
2,649 ACRES WORKED
MT. HOOD NAT'L. FOREST
1,295 ACRES TOTAL
150 ACRES UNWORKED
1,145 ACRES WORKED
CRATER LAKE NAT'L. PARK
522 ACRES TOTAL
ALL WORKED
SIUSLAW NAT'L. FOREST
ANNUAL REPORT 1938
H.E.G.

PART III - CHECKING

By

J. C. Crowell, Agent
J. N. Mitchell, Assistant Forester
S. D. Adams, Agent

INTRODUCTION

Checking work in the Sugar Pine Region for 1938 was characterized by several new features, the most outstanding being the expanded scope of advance checking. Formerly, working plans for control units had been based on data gathered by reconnaissance and preeradication surveys, augmented by a relatively small amount of advance checking data. This year some features of these two types of survey were combined and made a part of the advance check under the jurisdiction of the checking organization. The adaption of the standard strip method of checking to the needs of a Ribes reconnaissance survey involved the inclusion of such features as laying out checking unit control lines, the making of ground cover maps, and the taking of a pine count. The information for any given area as recorded by the advance checking method will assist in making an effective eradication plan. The work of making advance surveys was extended this year, as follows:

1. Lassen National Park - - - - - - - - - 11,326 acres
2. Yosemite National Park - - - - - - - - 20,630 acres
3. General Grant National Park - - - - 2,198 acres
4. Sequoia National Park - - - - - - - - 36,210 acres
5. Lassen National Forest - - - - - - - - 17,160 acres
6. Tahoe National Forest - - - - - - - - 16,231 acres

The importance of advance checking is illustrated by the fact that 180,974 acres were advance checked. Ribes eradication on the Lassen, Yosemite, and General Grant National Parks followed closely the advance checking work.

Another feature of the 1938 checking was the adoption of the upland strip method of checking stream type, which resulted in a reduction of the checking costs and in the saving of considerable checking time.

ORGANIZATION AND ADMINISTRATION

General

The checking work during 1938 was organized in a manner similar to that of 1937, all work being under the jurisdiction of the Bureau's regional checking supervisor, who was assisted by five full-time checking supervisors. During the field season 97 checkers were employed by the three agencies operating in California and Oregon, as follows:

Forty-six by the Bureau of Entomology and Plant Quarantine
Thirty-eight by the United States Forest Service
Thirteen by the National Park Service

There were various grade classifications of checkers; for example, the Bureau of Entomology and Plant Quarantine recognized the following positions:

Checker at $1440 per annum
Senior checker at $1620 per annum
Junior checker foreman at $1800 per annum
Checker foreman at $2000 per annum

The Forest Service ERA and CCC checkers of junior and senior grades were paid at the Bureau rates. For the same grades the National Park Service paid 67 cents and 75 cents per hour, respectively. The total earnings of the individual checkers under this scale varied in proportion to the number of hours they were permitted to work each month. The standardization of wages in each checking grade remains a problem to be worked out in the future.

The expansion of the blister rust control program on the National Forests and its extension to the National Parks during 1938 necessitated the employment of checker foremen. Their duties consisted of planning the checking work, examining the field work and records, and maintaining through strip retracements the desired standard of quality and reliability of the data.

Checking activities upon the operations were assigned to the checking supervisors as follows:

The Rogue River National Forest to L. N. Anderson
The Lassen Volcanic National Park, Lassen National Forest, and Plumas National Forest to S. D. Adams
The Tahoe and Eldorado National Forests to J. C. Crowell
The Yosemite National Park and Stanislaus National Forest to C. W. Fowler
The General Grant National Park, Sequoia National Park, and Sierra National Forest to J. N. Mitchell

Organization of Special Parties

Since no reconnaissance or cruise data were available on some of the parks and forests where control work will be undertaken in the near future, special advance checking parties were organized for work on these parks and forests. The organization of these parties and the administration of their work are described below:

The Tahoe National Forest

In compliance with the agreement between the United States Forest Service and the Bureau of Entomology and Plant Quarantine covering checking work on the Tahoe National Forest, the Bureau established a seven-man Government subsisted camp, employed all personnel, and supervised the field work. The Forest Service reimbursed the Bureau for all expenses of operation, including salaries.

The personnel consisted of one cook, one junior checker foreman, and five checkers. Near the end of the season four additional checkers were added for a two-week period in order to complete the desired amount of work. The camp was opened on August 1 and was closed on September 30.

The Yosemite National Park

The special party in the high country, which was equipped and financed by the National Park Service, consisted of a senior checker acting as chief of party, and two checkers. The checkers subsisted themselves. The party began work on July 7 and ended on September 30.

The Sequoia National Park

The special party operating on the Sequoia National Park consisted of a checker foreman and five checkers. Under the agreement between the Park Service and the Bureau the former paid the salaries of three checkers and the latter paid those of the checker foreman and two checkers. The men boarded at a CCC camp part of the time and subsisted themselves the remainder. Some of the equipment was furnished by the Bureau and some by the Park Service. The party began work on June 6 and ended September 30.

LOCATION AND DESCRIPTION OF AREAS

A complete description of the areas receiving both checking and Ribes eradication treatment during 1938 will be found under the eradication section of this report. Only those areas where special advance checks were conducted are described here.

Tahoe National Forest

The control unit lies at the southern end of the Tahoe National Forest midway between the North Fork and the Middle Fork of the American River at an elevation of from 4,500 to 6,500 feet above sea level. The topography is varied, ranging from minor ravines and long slopes in the eastern portion to precipitous canyons in the western.

The timber stand, which is all-aged, has a high percentage of mature sugar pine (a relatively large amount of brush interspersed with reproduction forms the understory). Sugar pine reproduction is found over a large part of the control unit. Although Ribes bushes are not numerous on a considerable part of the area, they range from common to abundant along the streams and in the brush patches on the higher ridge tops.

Although there has been no logging operation on this unit, except for an operation that cut selectively a small tract several years ago, one is scheduled to commence as soon as the new road is finished from Forest Hill to Mosquito Ridge. The checking work this year was handicapped by the poor roads serving the control unit.

Yosemite National Park

Advance checking in the "high country" of Yosemite National Park was done on four control units lying in the east-central part of the Park, namely, Mt. Hoffman, Tuolumne Meadows, Tioga Pass, and Little Yosemite Valley. The Mt. Hoffman unit lies along the Tioga Pass highway from Porcupine Flat to Tenaya Lake and includes May Lake, New May Lake trail, Snow Flat, and a portion of the Tenaya Lake trail to Yosemite Valley. The Tuolumne Meadows unit lies south and west of Tuolumne Meadows and includes all the white pine type in the vicinity of Fairview Dome, Cathedral Lake, and Elizabeth Lake, and extends southward in the Rafferty Creek basin to Tuolumne Pass and to a point one and one-half miles beyond. The Tioga Pass unit which is small, lies along the new Tioga Pass road adjacent to the Park boundary and around the Tioga Pass Ranger Station; it extends about 60 chains east and 60 chains west of the highway to timber line and about 120 chains southward from the Park boundary. The Little Yosemite Valley unit starts at the Old Cabin in Little Yosemite Valley and extends eastward along the floor of the valley to its head, including what is known as Lost Valley.

In appraising the working conditions on these units it is significant that the elevations ranged from 8,000 to 10,000 feet above sea level, and that typical of the high elevation types, the area is semibarren. The topography as a whole is not steep, but where a break does occur it is abrupt. Near streams and the tops of ridges, cliffs, granite outcroppings, and large boulder fields are common; these areas are extremely difficult and dangerous to traverse. Near timber line the topography becomes rough and almost impossible to work. In Little Yosemite Valley almost all the area covered was on the valley floor. The granite walls break abruptly into the valley and slope away only along the streams. In large parts of the areas that could not be reached by roads, long walks to and from work were necessary. Numerous good trails helped the situation. Much of the work was done from pack camps established along the trails.

In the high elevation types there are white bark pine (Pinus albicaulis) and western white pine (P. monticola) and in the Little Yosemite Valley there is a good stand of sugar pine (P. lambertiana). Very little brush occurs on the four areas; reproduction is moderate in amount. Ribes are abundant and generally distributed.

Sequoia National Park

Advance checking on the Sequoia National Park was performed in two localities selected by the Park Service. The first consisted of approximately 29,000 acres in the northwestern part of the Park in the vicinity of the Giant Forest, and the second embraced 7,000 acres in the southwestern part in the Atwell Mill district. Both locations lie in the basin of the Kaweah River at elevations from 4,500 to 8,500 feet. The topography of these two units is, for the most part, rugged and precipitous, being cut by many streams. For this reason the work was necessarily retarded and made more difficult. Three roads serve the Giant Forest unit and two the Atwell Mill unit; there are numerous trails in both, making them generally accessible.

Both units contain good stands of sugar pine and minor amounts of western white pine. Over the greater part of both units reproduction and brush form the understory.

Stanislaus National Forest

Early in May a post checking party was organized on the Stanislaus National Forest. On the Carl Inn unit in the southern part of the forest work was conducted for approximately six weeks, at the conclusion of which the camp was moved to the Middle Fork of the Stanislaus River. After operating for two weeks it was closed and an eradication camp was established from which the checkers worked. From six to ten checkers were employed in this work under the direction of a junior checker foreman. The 48,705 acres checked, all in virgin timber, were originally worked by the Ribes eradication forces in 1934.

Lassen Volcanic National Park

The Lassen Volcanic National Park lies at the northern end of the Sierra Nevada within the limits of the Lassen National Forest. Ribes eradication was begun on the Park in 1938 and advance and regular checking were conducted in connection with it. The four control units were completely advance checked, three of which received a regular check following Ribes eradication. Checking commenced on June 20 and ceased on September 28.

The topography in the Park ranges from flat to very steep. The ground cover is light and open. At the higher elevations there are stands of white bark pine, western white pine, and sugar pine, whose values are mainly aesthetic and recreational. There are large Ribes-free areas and smaller areas having medium to heavy Ribes populations.

METHODS OF WORK

Checking work was executed in practically the same manner as in previous years except for the adoption of the upland strip method of making the first regular check on stream type. The new method of sampling the stream type at the crossings of the upland strips superseded the slower and more costly method of running the zigzag traverse along the stream.

On the Rogue River operation in Oregon a special problem was how to obtain a satisfactory check of 8,021 acres of stream type out of 53,104 acres of total area. When a five percent check of stream type more than three chains wide (by the upland strip method) did not give a sufficient sample, strips were interpolated at $2\frac{1}{2}$ chain intervals and parallel to the upland strips. For all stream type checking in Oregon the percentage of check was reduced by this method from 12 percent in 1937 to 7.3 percent in 1938. The resulting decrease in cost was from 22 cents in 1937 to 16 cents in 1938.

In the development of the advance checking this year to provide information to be used as a basis for working plans, sectional ground cover maps were made on a scale of eight inches to the mile. Their

purpose is to show the amount of brush and reproduction according to the three classes of ground cover density recognized formerly in blister rust control reconnaissance work, namely:

1. 0 - 4: From zero to four tenths of the ground space is covered with brush or reproduction (or both).
2. 4 - 7: From four tenths to seven tenths of the ground space is covered.
3. 7 -10: From seven tenths to ten tenths of the ground space is covered.

Post checking was performed in the manner prescribed in the 1938 checking manual. A minimum check of $2\frac{1}{2}$ percent was made normally by running eight strips in each section, spaced ten chains apart. After the Ribes data were examined, a five percent check was made upon that part of the area where Ribes bushes were sparse or absent. This procedure provides the eradication supervisor with sufficient information provisionally to delimit on the field maps all blocks of 40 acres or more which do not appear to need Ribes eradication work.

WORK PERFORMED AND RESULTS OBTAINED

Explanation of Tables

The results of all classes of checking are presented in Tables 1 to 4, inclusive. Tables 1 and 4 give a summary and analysis of regular checking results; Table 2 summarizes advance and post checking; and Table 3 gives the cost of all classes of checking.

In Table 1 under the heading "Acres Covered by Check" appears the total number of acres on which a regular check was performed. In the adjacent column appear the acres which received Ribes eradication but were not checked. The summation of these two columns is the total number of acres receiving Ribes eradication, as reported in the eradication section. The percentage of check was computed by dividing the number of strip acres by the number of acres covered by the check. The "Man Days" column includes all man days actually spent running check strips and proportional amounts of training, travel, office, and checker foreman time. The total number of man days spent on training, travel, office work, and supervision (checker foremen) was prorated to the three classes of checking in proportion to the number of man days of field work for each class. The time of the checking supervisors, annual leave, sick leave, and off-duty time of the checkers is not included in the computations of this report.

The number of acres conforming to the five control standards are also shown in this table. A description of these five standards and the areas to which they apply follows:

Standard of Control	Ribes Population Class
1. Less than 25 feet of live stem per acre. (Blocked out area.)	Twenty-five feet of live stem or less per acre, seedlings absent. Advance check on blocked out area becomes final check data.
2. Eight feet of live stem or less per acre.	Twenty-six feet of live stem to 30 bushes per acre, seedlings rare.
3. Sixteen feet of live stem or less per acre.	Thirty-one to 150 bushes per acre, seedlings rare.
4. Twenty-five feet of live stem or less per acre.	Over 151 bushes per acre, regeneration apparently poor.
5. No individual bushes of 25 feet of live stem or more remaining.	Over 151 bushes per acre, regeneration good or expected to become good.

Table 1 is also an analysis of the acreage which did not meet the control standards. In compiling these data the 40-acre block was taken as the minimum area to be delimited. The per acre results were computed from the data shown on the final checking maps.

Table 2 is a summary of advance and post checking results. By "Acres Covered" is meant the total number of acres to which the sample applies. On areas of dense Ribes population as few as four check strips per section were required to establish the Ribes population classes. Although these strips were run at 20 chain intervals all acres in the section were claimed under "Acres Covered." The percentage of check was computed as in Table 1. "Man Days" includes all time actually spent running strips plus proportional amounts of training, travel, office, and checker foreman time.

Table 3 presents the cost of checking and the results attained per man day. Under "Man Days" the figures for all classes of check were obtained from Tables 1 and 2; the figures for "Eradication" and "Fire" were obtained from the checkers' time summaries. "Strip Acres per Checker Man Day" were computed on the basis of all man days excluding the time of the checker foreman. The figure for regular checking was computed on the basis of all check strips run (strip acres on first check plus strip acres on all subsequent checks).

The total cost of each operation includes the gross salaries of all checkers and checker foremen and the cost of operating all pickups (at four cents per mile) that were used on the checking project. The total cost of checking on the Yosemite National Park includes in addition to the preceding items, a cook's salary and the rental of pack stock which were necessary to operate the advance checking camp. The total cost of the checking project on the Tahoe National Forest also includes the following items: Net salaries of checker foreman, checkers, and cook; operating cost of two pickups; cost of subsistence; one third of the initial cost of special checking equipment; and the cost of

miscellaneous materials used in camp construction. From the total cost of each project the cost per effective man day was computed and from that the cost of each activity was established according to the number of effective man days spent on each.

The "Cost Per Acre on Basis of Acres Covered by Check" was computed from the total cost in the preceding column and the acreage figures in Tables 1 and 2. To compute the "Cost per Strip Acre" for regular check, the cost of regular checking was divided by the total number of strip acres on first check and subsequent checks.

Table 4 is an analysis of all regular checking. The total man day figures under "All Regular Checks" are those appearing in Table 1, and the total cost figures are those appearing in Table 3. The acres of first check were taken from Table 1 except for the Stanislaus operation where 662 acres received a first check but no final check, and are, therefore, included under "Acres Unchecked."

Analysis and Discussion of Results

Table 1. In round numbers, 99,200 acres were worked by eradication crews in 1938 in the Sugar Pine Region; 96.2 percent, or 95,400 acres of this area received a regular check. (It is notable that the regular checking of this 95,400 acres required 2,264 checker man days. These comprehensive figures provide the basis for a reliable estimate of 4,000 acres as being the average amount of worked area upon which one checker can perform the first and subsequent rechecks in the usual 4½ months' season of 96 working days.) From advance checks an additional 12,400 acres met control standards without crew work. Therefore, the total area having a final check was 107,800 acres.

The following table gives the acreage and percentage of the total acres claimed by eradication of each Ribes population class and the acreage and percentage of each class which meets control standards.

An Analysis of Acreage in Each Ribes Population Class

Ribes Population Class*		Acres by Class	Percentage of Total Area	Acres Not Meeting Control Standards	Acres Meeting Control Standards	Percentage of Each Class Meeting Control Standards
Not Worked (blocked out)	1	12,408	11.5	-	12,408	100.0
Worked Area	2	43,236	40.1	9,615	33,621	77.8
	3	28,042	26.0	8,351	19,691	70.2
	4	9,242	8.6	4,330	4,912	53.1
	5	14,913	13.8	1,987	12,926	86.7
	Totals	95,433	88.5	24,283	71,150	74.6
Grand Totals		107,841	100.0	24,283	83,558	77.5

* See Ribes Population Classes listed on preceding page.

Of the total area of 107,841 acres having a final check, 12 percent was shown by advance checking information to be sufficiently Ribes free to meet control standards without crew work; 40 percent of the total acreage was classed as having a light Ribes population; 26 percent supported a medium population; only 23 percent had a dense Ribes population (population classes 4 and 5). In the last group nine percent fell in the class of Ribes of retarded regeneration and 14 percent fell in the class of Ribes of increasing regeneration.

Within areas worked by eradication, those advance checked portions blocking out totaled 12,408 acres. This acreage represents the Ribes-free population class 1; hence by definition, 100 percent of the acreage in class 1 met control standards. Of the 95,433 acres worked by eradication crews, 75 percent met the control standards; the percentage by population class is as follows: 78 percent of the acreage in class 2 met the control standard; 70 percent of class 3 met the standard; 53 percent and 87 percent, respectively, met the standards for classes 4 and 5. The checked part of the area claimed by eradication totaled 107,841 acres, of which 78 percent met the control standards.

The average size of the Ribes bushes which remain on worked areas not meeting control standards does not vary greatly among the four population classes, as revealed in the following data:

Ribes Population Class	Average Size of Ribes Bushes Remaining on Areas not Meeting Control Standards in Terms of Feet of Live Stem
26 Feet of live stem - 30 Bushes per Acre	6.6
31 - 150 Bushes per Acre	5.6
Over 151 Bushes per Acre, regeneration poor	5.9
Over 151 Bushes per Acre, regeneration good	5.6
All Classes	5.9

Although these averages are drawn from greatly variable figures, and therefore are not very meaningful, it seems remarkable that the size of the average missed bush varies inversely with the original Ribes population and the degree of suppression which was sought. The fact that these averages for the higher population classes are low is explained by the fact that they are strongly weighted by the frequency of small bushes which increases markedly with the Ribes population, and further because no special effort was made to remove small bushes in the higher population classes.

Table 2. Roughly, the area covered by advance checking was 181,000 acres; by post checking 97,000 acres. These jobs required 2,420 and 1,515 checker man days, respectively. As these areas are

large and representative it is a good approximation that one checker, in the usual $4\frac{1}{2}$ months' season, should account for 7,000 acres of advance checking or 6,000 acres of post checking. These figures are simply broad averages which might serve as a basis in planning a checking program. In order to satisfy eradication requirements the percentage of post checking averaged 4.1 percent as against the average of 2.9 percent for advance checking, hence the acres covered per man day on advance checking were higher than on post checking. On the other hand, strip acres per man day were 14 percent less for advance checking than for post checking; the principal reasons for this are that advance checking requires more time in estimating and recording live stem because of the greater abundance of Ribes, that extra time is spent obtaining pine and ground cover data, and that more control lines are required in proportion to the number of strips run.

Table 3. Strip acres per man day is the most reliable expression of the output of a checking job; however it does not express efficiency very closely because such factors as ground cover, topography, and accessibility of the areas checked have a decided influence on checking production, and these factors vary enormously within any control unit as well as among the operations.

Cost per strip acre is not a reliable measure of the efficiency of a job for it varies not only as noted above but also with the cost per checker man day, which varies with rates of pay and with other items chargeable to the checking job.

Cost per acre covered is even less meaningful as a measure of checking efficiency or for use in comparisons between operations, because it varies not only with factors referred to in the last two paragraphs but also with the percentage of check.

The average cost of an effective checker man day in the Sugar Pine Region in 1938 was $6.51.

Table 4. The 25,000 acres of recheck represents 26 percent of the total acreage receiving a first check. This percentage is the same as that for rechecking in 1937. In 1936 the recheck amounted to 45 percent of the acreage upon which a first check was made. The fact that the amount of recheck for the last two seasons has been the same, 26 percent in each, indicates that rechecking has probably been reduced to the minimum. Rechecks cost 0.7 cents or 6 percent more per acre than first checks. The fact that rechecks are more expensive than first checks has been long established and is explained by the fact that recheck blocks are frequently small and isolated, resulting in a high proportion of travel time in relation to the time actually spent on the check strips.

When computed on approximately the same basis the cost of regular checking in the Sugar Pine Region in 1937 was 16 cents per acre as against 12 cents per acre in 1938; all checking, on the basis of total acres checked in 1937, cost 15 cents per acre as compared with 11 cents in 1938. Checking costs were reduced 4 cents per acre, or 27 percent under 1937 costs. Although figures are not available to support the speculation, it is evident that a portion of this large reduction is accounted for by a reduced percentage of check. Even though a lesser percentage of check was made in

1938 the saving is none the less significant because, in spite of the reduced percentage, adequate checking information was obtained. Specifically, the saving resulted from the practice of giving consideration to the individual requirements of small areas and from running only the minimum number of strips necessary to provide a sufficient check of each area. It is believed that the greatest reduction in checking cost was effected through the adoption of the new method of stream type checking which replaced the costly traverse method. Another reason for reduced cost was the greater amount of work accomplished in 1938, since the fixed costs of checking are prorated over the entire acreage covered, and since large checking jobs can be more efficiently conducted; 399,000 acres were covered by checks in 1938 as compared with 111,000 acres in 1937. It is likely that the additional time spent in 1938 on staff compass and chaining control resulted not only in more accurate maps and correspondingly more accurate checking information, but also in increased production through less time lost in the starting and tying in of check strips.

CONCLUSION

The present methods of checking in the Sugar Pine Region are the result of several years of intensified study and experimentation by the checking organization. The trend of developments in checking has kept pace with the requirements for planning and expanding the eradication program and with the analysis of the various phases of blister rust control work. Although the problems of personnel, administration, and policy are partly solved there is an ever-changing set of conditions that must be met by newer and better methods.

TABLE 1

SUMMARY OF REGULAR CHECKING AND CLASSIFICATION OF ACREAGE ACCORDING TO CONTROL STANDARDS IN THE SUGAR PINE REGION - 1938

Operation	Agency	Acres Covered by Check	Acres Un-checked	Per Cent of Check	Man Days	Acres Meeting Control Standards*					Acres Not Meeting Control Standards*											
											Control Standard No. 2			Control Standard No. 3			Control Standard No. 4			Control Standard No. 5		
												Per Acre			Per Acre			Per Acre			Per Acre	
						** No. 1	No. 2	No. 3	No. 4	No. 5	Acres	Bushes	Feet of Live Stem	Acres	Bushes	Feet of Live Stem	Acres	Bushes	Feet of Live Stem	Acres	Bushes	Feet of Live Stem
OREGON																						
Rogue River National Forest	EQ-ERA	18,222	190	5.2	409 7/8	7,614	6,497	4,094	-	3,206	2,325	5.2	20.1	1,503	11.8	50.3	449	12.0	84.4	148	18.1	106.8
CALIFORNIA																						
Lassen National Forest	EQ-ERA	3,711	129	4.8	82 4/8	-	1,492	391	120	360	748	7.1	138.3	260	15.8	65.3	300	15.2	137.1	40	37.3	137.3
	FS-CCC	8,544	-	4.8	204 5/8	-	5,575	870	170	27	997	4.6	37.7	80	8.9	52.9	785	10.2	94.7	40	10.0	72.5
	All	12,255	129	4.8	287 1/8	-	7,067	1,261	290	387	1,745	5.6	78.8	340	14.2	62.4	1,085	12.0	110.2	80	21.7	100.3
Plumas National Forest	EQ-ERA	1,116	-	4.8	32 6/8	-	-	-	138	563	-	-	-	-	-	-	219	18.5	94.9	196	32.2	153.1
	FS-ERA	3,806	4	4.6	111 5/8	35	253	950	700	474	175	9.0	100.3	704	8.4	69.3	510	10.5	70.3	40	11.0	282.0
	FS-CCC	2,368	8	5.1	72 3/8	243	1,342	607	158	-	40	6.0	32.7	87	11.8	61.1	134	28.7	213.3	-	-	-
	All	7,290	12	4.8	216 6/8	278	1,595	1,557	996	1,037	215	8.5	90.4	791	8.8	68.5	863	15.0	92.9	236	29.5	169.9
Eldorado National Forest	EQ-ERA	8,722	124	5.1	207 3/8	200	4,010	3,579	219	398	120	3.2	17.3	232	8.1	33.5	164	19.3	52.4	-	-	-
	FS-ERA	2,195	-	5.1	52 5/8	-	120	754	766	-	40	6.5	22.5	110	12.7	41.3	405	12.4	38.7	-	-	-
	FS-CCC	1,352	-	5.2	52 3/8	48	340	288	362	-	120	8.1	35.5	80	11.7	66.7	162	10.9	41.2	-	-	-
	All	12,269	124	5.1	312 3/8	248	4,470	4,621	1,347	398	280	5.8	25.9	422	9.9	41.6	731	13.8	42.5	-	-	-
Stanislaus National Forest	EQ-ERA	3,126	457	3.5	51 3/8	680	826	490	-	1,170	160	1.6	13.4	310	6.8	32.6	-	-	-	170	39.3	122.4
	FS-ERA	3,775	231	2.9	112 7/8	-	924	1,437	-	435	290	6.0	24.3	609	8.1	51.1	-	-	-	80	29.0	166.0
	FS-CCC	6,292	298	4.7	141 5/8	-	3,312	1,660	-	-	940	5.0	20.8	380	7.7	26.0	-	-	-	-	-	-
	FS-REG.	7,527	390	4.7	149 3/8	-	4,540	1,577	-	-	1,020	3.7	17.6	390	9.0	23.6	-	-	-	-	-	-
	All	20,720	1,376	4.2	455 2/8	680	9,602	5,164	-	1,605	2,410	4.3	19.2	1,689	8.0	33.6	-	-	-	250	35.9	136.3
Sierra National Forest	EQ-ERA	3,937	10	5.0	117 7/8	-	180	400	503	2,550	-	-	-	-	-	-	104	6.3	77.4	200	9.2	54.6
	FS-ERA	9,626	656	4.5	201 4/8	144	2,278	1,026	1,460	2,021	1,314	6.6	32.1	764	9.6	60.3	552	10.1	71.2	211	4.0	130.1
	FS-CCC	2,004	440	3.6	46 3/8	-	324	-	60	560	400	12.1	34.0	380	25.6	37.2	240	35.3	66.1	40	123.0	197.0
	All	15,567	1,106	4.5	365 6/8	144	2,782	1,426	2,023	5,131	1,714	7.6	32.5	1,144	13.9	52.9	896	15.3	70.8	451	29.7	99.2
Lassen National Park	NPS-CCC	1,738	61	5.0	36 1/8	2,934	653	727	26	-	148	2.0	52.0	184	5.2	63.6	-	-	-	-	-	-
Yosemite National Park	NPS-CCC	5,569	775	4.7	143 5/8	510	855	711	125	1,162	678	7.5	47.4	1,136	11.8	69.2	80	14.5	120.6	822	12.0	147.9
General Grant National Park	NPS-CCC	1,803	-	4.2	37 2/8	-	100	130	105	-	100	6.3	85.4	1,142	17.6	153.9	226	27.7	179.5	-	-	-
California Totals - -		77,211	3,583	4.6	1,854 2/8	4,794	27,124	15,597	4,312	9,720	7,290	5.8	43.1	6,848	11.5	68.7	3,881	14.7	84.9	1,839	21.2	120.1
REGION																						
All Agencies Sugar Pine Region		95,433	3,773	4.7	2,264 1/8	12,408	33,621	19,691	4,912	12,926	9,615	5.6	37.1	8,351	11.6	64.9	4,330	14.4	84.8	1,987	20.9	118.8

* See text for definition of control standards.
** This column represents the acreage eliminated from crew work by advance check.

TABLE 2

SUMMARY OF ADVANCE AND POST CHECKING IN THE SUGAR PINE REGION - 1938

Operation	Agency	ADVANCE CHECK Acres Covered	ADVANCE CHECK Percent of Check	ADVANCE CHECK Man Days	POST CHECK Acres Covered	POST CHECK Percent of Check	POST CHECK Man Days
OREGON							
Rogue River National Forest	EQ-ERA	19,866	4.0	263 2/8	10,888	5.1	165 7/8
CALIFORNIA							
Lassen National Forest	EQ-ERA	9,600	2.2	87 7/8	7,040	5.1	107 4/8
	FS-CCC	7,560	1.9	50	10,300	4.7	178 4/8
	All	17,160	2.1	137 7/8	17,340	4.9	286
Plumas National Forest	EQ-ERA	9,410	3.2	109 3/8	5,448	2.8	44
	FS-ERA	14,090	1.5	112 5/8	-	-	-
	FS-CCC	4,720	2.2	43	4,400	3.2	43 1/8
	All	28,220	2.2	265	9,848	3.0	87 1/8
Tahoe National Forest	FS-REG	16,231	4.0	338	-	-	-
Eldorado National Forest	EQ-ERA	15,349	3.2	221 4/8	-	-	-
	FS-ERA	5,886	2.8	76 3/8	-	-	-
	FS-CCC	4,270	2.5	63 3/8	1,930	2.5	22 6/8
	All	25,505	3.0	361 2/8	1,930	2.5	22 6/8
Stanislaus National Forest	EQ-ERA	-	-	-	34,990	3.9	550 6/8
	FS-ERA	-	-	-	2,430	3.2	32 7/8
	FS-CCC	-	-	-	7,908	4.3	142 5/8
	FS-REG	-	-	-	3,377	4.4	56 4/8
	All	-	-	-	48,705	4.0	782 6/8
Sierra National Forest	EQ-ERA	-	-	-	1,960	3.0	35 5/8
	FS-ERA	3,628	2.9	67 6/8	3,331	2.9	64 1/8
	FS-CCC	-	-	-	1,920	3.3	50
	All	3,628	2.9	67 6/8	7,211	3.0	149 6/8
National Parks							
Lassen	NPS-CCC	11,326	4.7	131 5/8	-	-	-
Yosemite	NPS-CCC	20,630	2.7	268 1/8	1,110	4.8	21 1/8
General Grant	NPS-CCC	2,198	2.9	34 4/8	-	-	-
Sequoia	(EQ-REG NPS-CCC	36,210	2.5	553	-	-	-
California Totals		161,108	2.8	2,157 1/8	86,144	3.9	1,349 4/8
Regional Totals		180,974	2.9	2,420 3/8	97,032	4.1	1,515 3/8

TABLE 5

ACRES CHECKED PER MAN DAY AND COST OF CHECKING IN THE SUGAR PINE REGION - 1938

Operation	Item	Man Days: Number	Man Days: Percent of Total	*Strip Acres Per Checker Man Day	Total Cost	Cost Per Acre Basis of Acres Covered by Check	Cost Per Strip Acre
Rogue River National Forest	Regular Checking	409 7/8	46.5	2.3	$ 2,363.64	$0.130	$2.51
	Advance Checking	263 2/8	29.9	3.0	1,518.10	.076	1.90
	Post Checking	165 7/8	18.8	3.4	956.54	.088	1.72
	Eradication	42 2/8	4.8	-	243.66	-	-
	Total	881 2/8	100.0	-	5,081.94	-	-
Lassen National Forest	Regular Checking	287 1/8	35.7	3.0	1,849.62	.151	2.22
	Advance Checking	137 7/8	17.1	2.7	888.17	.052	2.53
	Post Checking	286	35.5	3.1	1,842.38	.106	2.18
	Eradication	50 6/8	6.3	-	326.93	-	-
	Fire	43 4/8	5.4	-	279.58	-	-
	Total	805 2/8	100.0	-	5,186.68	-	-
Plumas National Forest	Regular Checking	216 6/8	33.2	2.3	1,396.05	.192	2.96
	Advance Checking	265	40.6	2.4	1,706.83	.060	2.79
	Post Checking	87 1/8	13.4	3.6	561.16	.057	1.90
	Eradication	32 6/8	5.0	-	210.93	-	-
	Fire	50 6/8	7.8	-	326.93	-	-
	Total	652 3/8	100.0	-	4,201.90	-	-
Tahoe National Forest	Advance Checking	338	100.0	2.3	2,975.15	.183	4.59
Eldorado National Forest	Regular Checking	312 3/8	39.1	2.5	2,018.34	.165	2.67
	Advance Checking	361 2/8	45.2	2.2	2,333.22	.091	3.07
	Post Checking	22 6/8	2.8	2.4	144.54	.075	3.02
	Eradication	96 1/8	12.0	-	619.44	-	-
	Fire	7 2/8	0.9	-	46.46	-	-
	Total	799 6/8	100.0	-	5,162.00	-	-
Stanislaus National Forest	Regular Checking	455 2/8	36.1	2.7	2,740.86	.132	2.47
	Post Checking	782 6/8	62.1	2.7	4,908.72	.101	2.54
	Eradication	22	1.8	-	136.67	-	-
	Total	1,260	100.0	-	7,786.25	-	-

* On the basis of total man days, exclusive of checker foreman.

TABLE 3 (CONTINUED)

Operation	Item	Man Days: Number	Man Days: Percent of Total	*Strip Acres Per Checker Man Day	Total Cost	Cost Per Acre Basis of Acres Covered by Check	Cost Per Strip Acre
Sierra National Forest	Regular Checking	365 6/8	55.7	2.5	$ 2,433.44	$0.156	$3.07
	Advance Checking	67 6/8	10.3	1.8	450.76	.124	4.25
	Post Checking	149 6/8	22.8	1.6	996.33	.138	4.59
	Eradication	72 3/8	11.0	-	481.53	-	-
	Fire	1	0.2	-	6.65	-	-
	Total	656 5/8	100.0	-	4,368.71	-	-
Lassen National Park	Regular Checking	36 1/8	19.5	3.6	251.78	.145	1.94
	Advance Checking	131 5/8	71.1	4.1	917.39	.081	1.72
	Eradication	17 4/8	9.4	-	121.97	-	-
	Total	185 2/8	100.0	-	1,291.14	-	-
Yosemite National Park	Regular Checking	143 5/8	30.8	2.1	804.33	.144	2.67
	Advance Checking	268 1/8	57.6	2.1	2,121.17	.103	3.86
	Post Checking	21 1/8	4.5	2.5	118.10	.106	2.21
	Eradication	33 1/8	7.1	-	185.23	-	-
	Total	466	100.0	-	3,228.83	-	-
General Grant National Park	Regular Checking	37 2/8	42.0	2.9	218.26	.121	2.05
	Advance Checking	34 4/8	39.0	1.9	202.15	.092	3.16
	Eradication	13 6/8	15.2	-	80.57	-	-
	Fire	3 4/8	3.8	-	20.51	-	-
	Total	89	100.0	-	521.49	-	-
Sequoia National Park	Advance Checking	553	100.0	2.0	3,733.99	.103	4.11
Regional Totals	Regular Checking	2,264 1/8	33.8	2.5	14,076.32	.147	2.55
	Advance Checking	2,420 3/8	36.2	2.4	16,846.93	.093	3.16
	Post Checking	1,515 3/8	22.7	2.8	9,527.77	.098	2.41
	All Checking	6,199 7/8	92.7	2.5	40,451.02	.108	2.73
	Eradication	380 5/8	5.7	-	2,406.93	-	-
	Fire	106	1.6	-	680.13	-	-
	Grand Total	6,686 4/8	100.0	-	$43,538.08	-	-

* Cn the basis of total man days, exclusive ofchecker foreman.

TABLE 4

ANALYSIS OF ALL REGULAR CHECKING IN THE SUGAR PINE REGION - 1938

Operation	First Check				Rechecks				All Regular Checks			
	Man Days	Acres	Total Cost	Cost Per Acre	Man Days	Acres	Total Cost	Cost Per Acre	Man Days	Acres	Total Cost	Cost Per Acre
Rogue River National Forest	326 7/8	18,222	$ 1,885.00	$.103	83	4,128	$ 478.64	$.116	409 7/8	22,350	$ 2,363.64	$.106
Lassen National Forest	188	12,255	1,211.06	.099	99 1/8	5,174	638.56	.123	287 1/8	17,429	1,849.62	.106
Plumas National Forest	155	7,290	998.33	.137	61 6/8	2,692	397.72	.148	216 6/8	9,982	1,396.05	.140
Eldorado National Forest	250 6/8	12,269	1,620.18	.132	61 5/8	2,566	398.16	.155	312 3/8	14,835	2,018.34	.136
Stanislaus National Forest	359 7/8	21,382	2,166.92	.101	95 3/8	5,870	573.94	.098	455 7/8	27,252	2,740.86	.101
Sierra National Forest	321 6/8	15,567	2,140.69	.138	44	1,982	292.75	.148	365 6/8	17,549	2,433.44	.139
Lassen National Park	22 2/8	1,738	155.08	.089	13 7/8	919	96.70	.105	36 1/8	2,657	251.78	.095
Yosemite National Park	124 3/8	5,569	696.55	.125	19 2/8	839	107.78	.128	143 5/8	6,408	804.33	.126
General Grant National Park	24 6/8	1,803	144.88	.080	12 4/8	923	73.38	.080	37 2/8	2,726	218.26	.080
Regional Totals	1,773 5/8	96,095	$11,018.69	$.115	490 4/8	25,093	$3,057.63	$.122	2,264 1/8	121,188	$14,076.32	$.116

PART IV

SCOUTING FOR BLISTER RUST

By

Winfield B. Dunshee, Agent

SUMMARY OF PAST WORK

From 1929, when scouting for white pine blister rust was first undertaken in California on an organized basis, until 1936, small scouting parties of from one to six men covered the more northerly regions of California searching for the first evidence of blister rust within the State. Occasionally the hunt was varied by sporadic forays into Oregon to check on the spread of the rust there (which had been found on Ribes in 1925 and on white pines in 1928) and to obtain new leads on possible avenues of entry into California. For seven consecutive years no blister rust infections were found south of the Oregon line; then in 1936 five separate infection points were found in California. Two of these were on sugar pines and three on Ribes. Now that blister rust had thrust a tenacle five miles south of the California-Oregon line the next question was how quickly and to what extent would it spread southward.

A rather alarming answer was given in 1937, for that year, a favorable one for aeciospore dissemination, saw blister rust jump a distance of 125 miles south into the Trinity National Forest. Scouting toward the Sierra Nevada brought further light on the subject, for rust on Ribes was found near Mill Creek in the Lassen National Forest, 120 miles south of Oregon. In all, forty-one separate Ribes infection points were discovered in California that year.

Scouting for the rust was also carried on in Southern Oregon during July and August of 1937. Although only a short period of time was allotted for work in that region, results showed a general and uniform spread of the disease to Ribes in Douglas, Josephine, and Jackson Counties, a condition certain to result later in a sizable amount of sugar and white pine infection.

ORGANIZATION AND LOCATION OF 1938 WORK

With the coming of midsummer in 1938, blister rust scouting activities in the Sugar Pine Region were again renewed. Inasmuch as in the previous year the rust had penetrated nearly to the northern boundary of the Mendocino National Forest in the Coast Range, it was decided to confine scouting to the Sierra Nevada in an effort to trace the disease south of the 1937 Mill Creek find in the Lassen National Forest.

Accordingly in the last week of July 1938, four men were organized as a nucleus to start scouting in the Lassen National Forest under the direction of S. Daryl Adams, Checking Supervisor of the Plumas-Lassen operation. Later this nucleus grew to seven appointed men and three

security wage workers. To facilitate their activities three pickup trucks were placed at the party's disposal. Two of these men, W. B. Dunshee and H. G. Lachmund, were assigned to scout the Sierra Nevada from the Pit River in the north to as far south as conditions warranted; the other eight restricted their activities to the Plumas and Lassen National Forests and Lassen National Park, utilizing Gurnsey Blister Rust Control Camp as their base. As a rule, the work was done by one appointed man and one security wage worker scouting together, and following this procedure all ten men were able to work portions of 78 townships in the following areas: Red Mountain, Terry Mill, Hat Creek, Viola, Morgan Springs, Drakesbad, Mineral, Round Valley, Lake Almanor, Seneca, Chico Meadows, Stirling City, North Fork of the Feather River, Buck's Lake, Cascade, La Porte, Challenge, Downieville, Sierraville, Camptonville, Donner Lake, French Meadows, and the Rubicon.

Coincident with the Bureau's parties, G. A. Zentmyer, Assistant Pathologist attached to the Division of Forest Pathology, spent several months in northern California scouting in portions of the Klamath River basin and in territory southeast of Mount Shasta. Such scouting as Zentmyer was able to do was in conjunction with other studies of blister rust, and was of necessity confined almost entirely to a check of previously known favorable scouting areas.

No organized scouting was undertaken in Oregon during 1938, all scouting being incidental to the Ribes eradication program. Nevertheless, as the supervisory personnel and the checking organization performed their regular duties, they were on the alert for infected pines and Ribes, and as a result several infected Ribes bushes were found in unworked areas of the Upper Rogue unit. However, as such discoveries added but little to the already known Oregon picture, this report will limit itself to California and activities of:

1. The Division of Forest Pathology, and
2. Bureau scouting forces under the direction of S. Daryl Adams.

WORK PERFORMED AND RESULTS OBTAINED

Tables 1 and 2 show the results of scouting in California, and the scouting chart depicts activities in the Sierra Nevada.

1. The Division of Forest Pathology

On August 11, 1938, Doctors Wagener and Zentmyer investigated the rust infection center discovered in 1936 on the east fork of Indian Creek. Infected R. bracteosum and R. sanguineum were common near the site of the center, which showed much less infection than two years previously because the original infected pines had been destroyed. Several infected young sugar pines were found in the immediate vicinity but they bore no sporulating cankers.

Later, Zentmyer located small Ribes infections along Shovel Creek north of Mount Shasta and on Seiad Creek in the Klamath country. However, investigations in the Terry Mill area southeast of Mount Shasta resulted in the discovery of 300 infected Ribes. Fifty of these were R. nevadense

and the remainder R. roezli. Most of the infection was found on the north and south forks of Montgomery Creek, but it extended as far as Hatchet Creek, Little Hatchet Creek, Goat Creek, and Sanders Ridge, and infected Ribes were actually scattered through 22 sections in four adjacent townships. Roughly, one out of every ten bushes examined was infected, the degree of intensity ranging from one to over one thousand infected leaves on a single bush. This find was perhaps the most notable of the year, especially when compared with the previous season when a careful search of this same area had disclosed two infected Ribes bushes, each with but one leaf infected.

2. Bureau Scouting Forces under the Direction of S. Daryl Adams

Dunshee and Lachmund began scouting at the Terry Mill area where their efforts were largely directed towards discovering infected sugar pines. A thorough examination of the younger age classes of pine failed to locate pine infection. It was not possible to examine thoroughly the mature pines, and it is possible that pine infection may be present in one or more of the mature pines in this locality.

After Terry Mill, the next scene of scouting activity was Viola, in the western part of the Lassen National Forest. Here, others of Adams' party had uncovered the second largest infection center of the year, consisting of 120 infected Ribes of three species all in close association with sugar pine. Although this area had been examined in 1937, no rust had been found. Dunshee and Lachmund again concentrated on examining sugar pines, but despite a close examination of a large number of trees no cankers were observed. Here again it is felt that pine infection may be present in the mature trees.

Proceeding south from Viola the scouts found blister rust on Ribes at six other locations, namely, at Cement Creek, Soda Springs, Big Chico Creek, and Clear Creek on the Lassen National Forest, and at Buck's Lake and Cascade on the Plumas National Forest. In each case the infection was comparatively small, no more than three infected bushes being picked up at any one site, and always on the same species, R. roezli.

Leaving Adams' main party in the southern Plumas, Dunshee and Lachmund again moved to the southward and established themselves at the Camptonville Ranger Station in the Tahoe National Forest. Here the Ribes-pine association was not so favorable as farther north, and a week's work brought to light nothing more significant than pinyon rust on one R. roezli. Small areas in the vicinity of Sierraville and Donner Lake were also scouted and yielded "rust" with the minimum of searching. However, as the localities in question were close to a group of pinyon pines at Loyalton, and also to infected pinyon pines near Virginia City, Nevada, little hope was held that such discoveries would be blister rust. Later they were determined in Washington, D. C. as pinyon rust.

Because reports from the Eldorado checking and eradication personnel indicated the presence of large amounts of pinyon rust in the northern extremities of that forest, it was deemed advisable to scout there with the thought that possibly among all the pinyon rust infections being found some blister rust might also be present. Accordingly, the Goggin's Mine Control

Camp was utilized as a base, and more than fifty specimens of infected Ribes leaves were collected and sent to Washington for identification, the result being 100 percent pinyon rust.

* * * * *

Viewed in retrospect, the past season furnished the California office of Blister Rust Control with valuable and pertinent information. Not only were two large centers of Ribes infection discovered, but the southernmost known limit of blister rust on Ribes was extended 40 miles beyond the 1937 Mill Creek find to as far south as Cascade in the southern Plumas, 160 miles from the Oregon line.

The ten Bureau scouts employed during the season worked a total of 216 effective man days. Two of these men were appointed solely for scouting, five were appointed as checkers and used partly for scouting, and the remaining three were taken from the relief rolls.

TABLE 1

NUMBER OF RIBES AND PINES EXAMINED FOR BLISTER RUST IN CALIFORNIA DURING 1938

Host Species	Number of Host Plants Examined in Each County									Total by Species	Percent of Hosts Examined by Species
	Butte	El Dorado	Nevada	Placer	Plumas	Shasta	Sierra	Tehama	Yuba		
Ribes cereum							10	24		34	.07
Ribes inerme	100				60	75		752		987	2.10
Ribes montigenum								13		13	.03
Ribes nevadense	375			66	424	827	15	1,188		2,895	6.20
Ribes roezli	2,372	107	16	2,593	17,546	6,884	2,874	7,133	2,957	42,482	91.10
Ribes viscosissimum					85			128		213	.50
Total by Counties	2,847	107	16	2,659	18,115	7,786	2,899	9,238	2,957	46,624	100.00
Pinus lambertiana	43				113	450		484	1	1,091	89.6
Pinus monticola								127		127	10.4
Total by Counties	43				113	450		611	1	1,218	100.0

TABLE 2

BLISTER RUST INFECTIONS FOUND IN CALIFORNIA DURING 1938

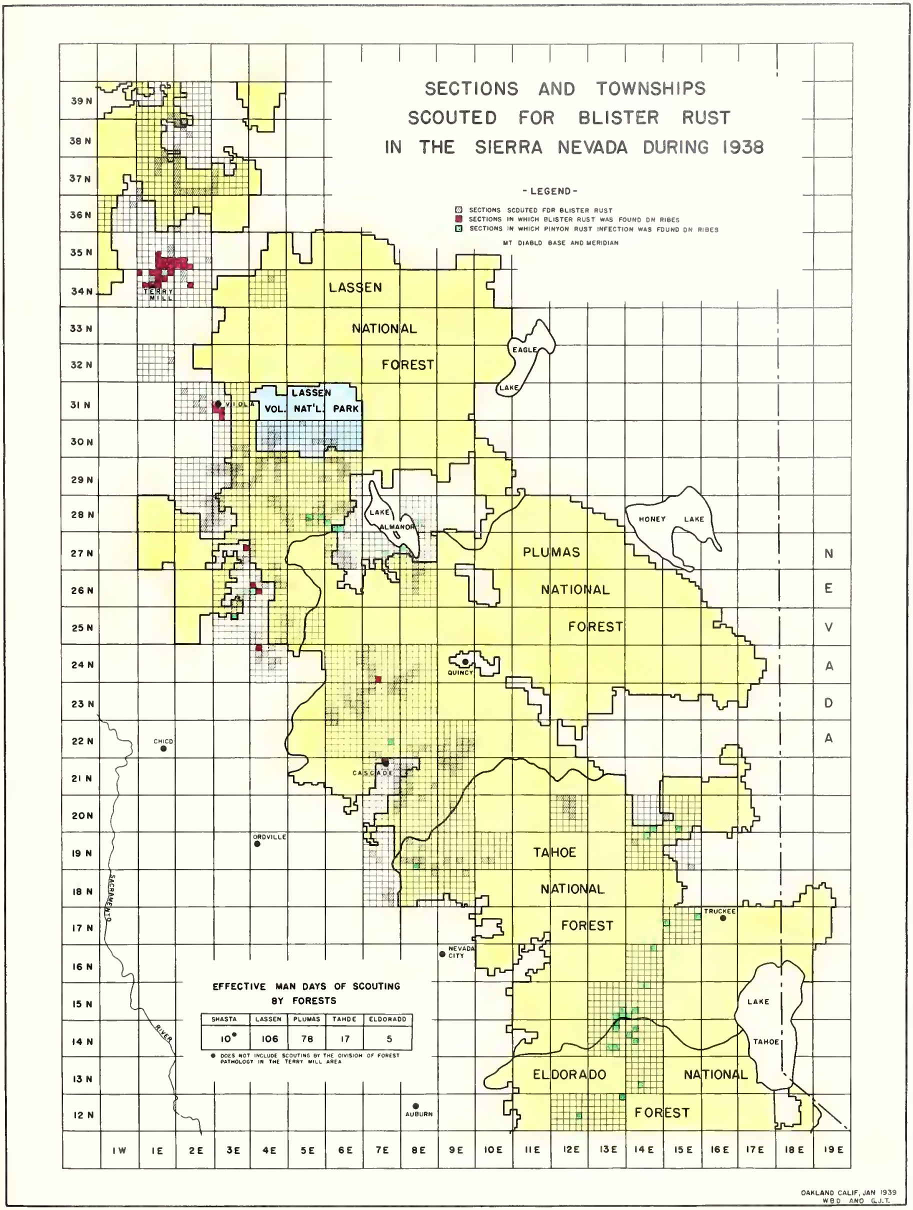
County	Region and Forest	Index Number	Town-ship	Range	Sec-tion	Host Infected Species	Host Infected No.	Inspectors	Date	Remarks
Siskiyou	Shovel Creek*, Klamath National Forest	47	47N	3W	25	R. petiolare R. sanguineum	2 1	Zentmyer	Aug. 3	Infected bushes scattered over 1/4 mile along stream. Young sugar pines on area.
	Seiad Creek* Klamath National Forest	48	47N	11W	29	R. sanguineum	1	Zentmyer	Aug. 12	Twenty infected leaves on single bush.
Shasta	Hatchet Creek	49	35N	1E	22					About 10 percent of
	and				25					bushes scouted over area
	Montgomery Creek*				26					were infected. Some
					27					bushes had upwards to
					34					1,000 leaves infected.
					35					Good telial on both
					36	R. roezli	250		Aug.	Ribes Hosts. Sugar pine
			35N	2E	29				15	reproduction common over
					30	and		Zentmyer		the area.
					31				to	
	Between Shasta				32	R. nevadense	50			
	and Lassen				33				Oct.	
	National Forests		34N	1E	1				25	
					3					
					4					
					6					
					10					
					11					
					15					
					16					
					17					
			34N	2E	16					

* Denotes discovery made by members of Division of Forest Pathology (Bureau of Plant Industry)

TABLE 2 (CONTINUED)

BLISTER RUST INFECTIONS FOUND IN CALIFORNIA DURING 1938

County	Region and Forest	Index Number	Town-ship	Range	Sec-tion	Host Infected Species	No.	Inspectors	Date	Remarks
Tehama	Bailey Creek, Vicinity of Viola Lassen National Forest	50	31N	3E	19 29 30 32	R. roezli R. inerme R. nevadense	100 20 1	Veirs Delering	Aug. 29	Pine association good. Ribes infection scattered for 1/4 mile along west side of Bailey Creek.
	Cement Creek, Lassen National Forest	51	27N	3E	13	R. roezli	3	Schmahl Veirs Delering Knight	Aug. 11	About 10 percent of leaves were infected.
	Soda Springs, Lassen National Forest	52	26N	4E	18	R. roezli	1	Schmahl Knight	Aug. 17	Good scouting on dry cut-over type. Pinyon rust also found.
	Big Chico Creek, Lassen National Forest	53	26N	4E	20	R. roezli	3	Schmahl Knight	Aug. 18	Few leaves infected. Ribes-pine association good.
Butte	Clear Creek, near Lassen National Forest	54	24N	4E	5	R. roezli	3	Schmahl	Sept. 9	Few leaves infected. Ribes abundant.
Plumas	Buck's Lake, Plumas National Forest	55	24N	7E	33	R. roezli	1	Veirs Delering	Aug. 31	Sugar pine rare. Few infected leaves on bush.
	Cascade, Plumas National Forest	56	21N	7E	3	R. roezli	1	Dunshee Lachmund	Sept. 20	Ribes-pine association excellent. Three Pinyon rust infections found close by.


SECTIONS AND TOWNSHIPS
SCOUTED FOR BLISTER RUST
IN THE SIERRA NEVADA DURING 1938
- LEGEND -
SECTIONS SCOUTED FOR BLISTER RUST
SECTIONS IN WHICH BLISTER RUST WAS FOUND ON RIBES
SECTIONS IN WHICH PINYON RUST INFECTION WAS FOUND ON RIBES
MT DIABLO BASE AND MERIDIAN
LASSEN NATIONAL FOREST
LASSEN VOL. NAT'L. PARK
PLUMAS NATIONAL FOREST
TAHOE NATIONAL FOREST
ELDORADO NATIONAL FOREST
EAGLE LAKE
LAKE ALMANOR
HONEY LAKE
LAKE TAHOE
NEVADA
TERRY MILL
VIOLA
QUINCY
CHICO
CASCADE
ORDVILLE
TRUCKEE
NEVADA CITY
AUBURN
SACRAMENTO RIVER
39 N
38 N
37 N
36 N
35 N
34 N
33 N
32 N
31 N
30 N
29 N
28 N
27 N
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24 N
23 N
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19 N
18 N
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16 N
15 N
14 N
13 N
12 N
1 W
1 E
2 E
3 E
4 E
5 E
6 E
7 E
8 E
9 E
10 E
11 E
12 E
13 E
14 E
15 E
16 E
17 E
18 E
19 E
EFFECTIVE MAN DAYS OF SCOUTING
BY FORESTS
SHASTA
LASSEN
PLUMAS
TAHOE
ELDORADO
10●
106
78
17
5
● DOES NOT INCLUDE SCOUTING BY THE DIVISION OF FOREST PATHOLOGY IN THE TERRY MILL AREA
OAKLAND CALIF, JAN 1939
WBD AND G.J.T.

PART V

DEVELOPMENTAL WORK IN METHODS OF RIBES ERADICATION AND RIBES ECOLOGY IN THE SUGAR PINE REGION FOR 1938

By

H. R. Offord, Pathologist, C. R. Quick, Assistant Pathologist, and L. P. Winslow, Agent

INTRODUCTION

This report describes the developmental work in methods of Ribes eradication and Ribes ecology studies in the Sugar Pine Region for the calendar year 1938.

The eradication of *Ribes roezli* seedlings with oil was continued on the Sierra National Forest by small scale toxicity tests with new oil mixtures, and by testing spray equipment and crew methods on a practical basis. Additional tests were made on troublesome *R. cereum* and *R. nevadense* by decapitating them and applying dry sodium thiocyanate or Diesel oil. Preliminary trials were given to blasting as a method for uprooting large *R. nevadense* growing in thick brush. Several Ribes ploughs were constructed and tested, primarily for work on heavy concentrations of *R. roezli*.

The ecological work of the year 1938 was mainly a continuation of problems initiated in California in 1936 and 1937. Details of the previous work are given in the annual report for the Sugar Pine Region, 1937 (pp. 131-145), and the annual report for the Far Western Region, 1936 (pp. 240-245 and 280-285).

One new project, a study of the occurrence, growth rate, and regeneration of Ribes in dense snowbrush (*Ceanothus cordulatus* Kell.) was started. This study is similar in objective to the series of brush plots started in 1936, but is more specific in that emphasis is placed on the single species of brush.

RESULTS OF 1937 FIELD WORK

Decapitation Tests in California

On August 9 and 10, Offord and Winslow checked the *R. roezli* decapitation plots at Boggy Meadows, Sierra National Forest, California. Diesel oil and Diesel oil in combination with other materials showed 97-100 percent crown kill, while sodium ethyl xanthate was much less effective, killing from 71 to 89 percent of the crowns.

The decapitation plots on *R. nevadense*, established at Mt. Raymond Mill during 1937, were checked August 5, 1938. Many of the crowns had been wholly or partially washed out and many identification stakes had been carried away by the unusually high water of the preceding winter.

Data were not recorded for unstaked crowns or for crowns which appeared to have been severely buffeted by rock and high water.

Results for the decapitation tests on R. roezli and R. nevadense are shown in Table 1.

TABLE 1

RESULTS OF 1937 DECAPITATION TESTS ON R. ROEZLI AND R. NEVADENSE, SIERRA NATIONAL FOREST, CALIFORNIA

Plot Numbers and Ribes Species		Chemical Used[1]	Fluid Ounces of Chemical Used	Number of Crowns Treated	Percent[2] Crowns Killed
R. roezli	1	Sodium ethyl xanthate (2 lbs. per gal. H_2O)	2-4	51	89.7
	5	do. (1 lb. per gal. H_2O)	2-6	100	71.6
	3	Diesel oil	2-6	52	100.0
	6	do.	2-4	100	98.9
	2	Diesel oil + furfural sat. with ammonium thiocyanate (5:1)	2-4	51	97.3
	7	do. do.	2-4	100	98.9
	4	do. (7:1)	2	70	98.3
	8	do. do.	1-4	100	98.9
	9	do. (10:1)	1-5	100	100.0
R. nevadense	1	Sodium ethyl xanthate (2 lbs. per gal. H_2O)	2-6	51	37.8
	2	Diesel oil	2-17	100	67.7
	3	Diesel oil + furfural sat. with ammonium thiocyanate (5:1)	1-10	100	52.2
	4	do. (7:1)	1-10	100	62.5

1/ See pages 114-117 of 1937 annual report for details of dosages.

2/ Treatment of intact bushes with 8 and 14 ounce dosages of Diesel oil and Diesel oil + furfural saturated with ammonium thiocyanate gave 95 to 100 percent kill.

The percent kill was lower for R. nevadense than for R. roezli due to the difficulty of obtaining thorough coverage of R. nevadense crowns in rock crevices or mud.

Table 2 presents the results of analyzing bush kill on the basis of several factors which affect the treatment. The relationship between size of bush (feet of live stem) and bush kill is shown graphically for R. nevadense in Figure 1A, and for R. roezli in Figure 1B. Data from the sodium ethyl xanthate plots were selected for graphic presentation because of the wide range of survival by bushes of various size classes.

TABLE 2

ANALYSIS OF DATA ON BUSH KILL TAKEN FROM 1937 DECAPITATION PLOTS ON R. NEVADENSE

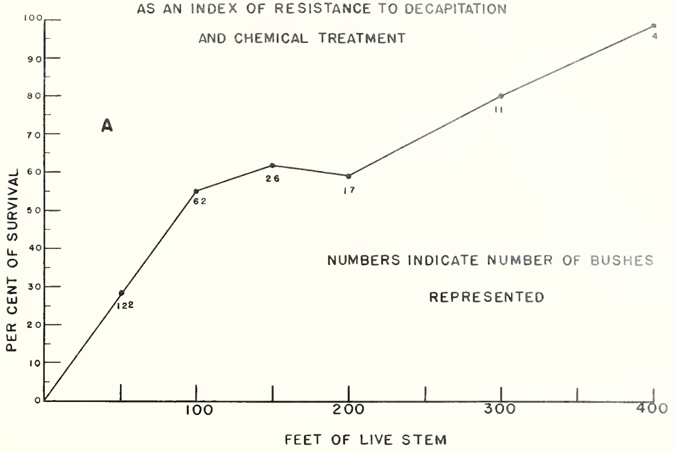
Plot No.	Chemical Used	Dosage in Fluid Ounces	Percent Kill	Square Inch of Crown Covered Per Ounce		Percent Kill by F.L.S. Classes			Percent Kill by Crown Area Classes (Sq. In.)				Percent Kill by Moisture Classes	
				Alive	Dead	0-50	51-100	101-300	0-5	6-10	11-20	21 +	Moist	Wet
1	A*	2-6	37.80	8.09	5.86	-	20.0	41.8	66.4	50	40.0	18.3	32.2	-
2	B*	2-17	63.75	5.01	3.49	70.6	66.7	46.2	80.0	75	52.7	41.7	50.0	57.2
3	C*	1-10	52.25	4.90	4.35	65.1	26.6	33.4	75.0	40	42.8	50.0	61.7	53.3
4	D*	1-10	62.50	4.95	3.84	80.0	41.6	44.4	87.5	48	55.0	52.7	63.6	62.5

* A = Sodium ethyl xanthate, 2 lbs. per gallon of water.
B = Diesel oil, 27° Bé
C = Diesel oil 27° Bé + furfural saturated with ammonium thiocyanate (5:1).
D = do. do. do. (7:1).

FIGURE I

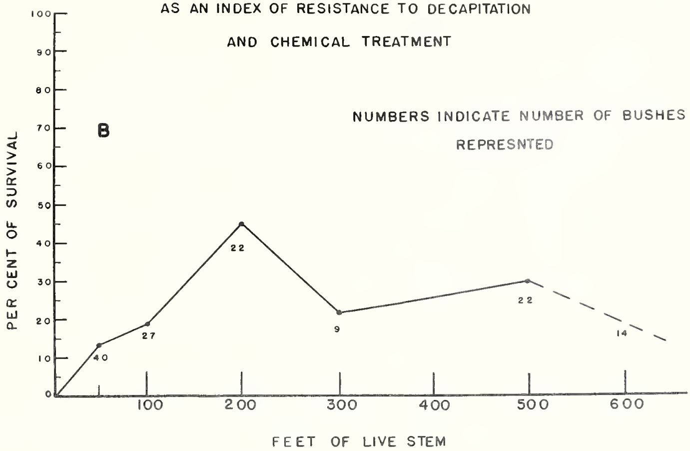
1937 R.NEVADENSE PLOTS

SIZE OF BUSH - FEET OF LIVE STEM -
AS AN INDEX OF RESISTANCE TO DECAPITATION
AND CHEMICAL TREATMENT



1937 R.ROEZLI PLOTS

SIZE OF BUSH - FEET OF LIVE STEM -
AS AN INDEX OF RESISTANCE TO DECAPITATION
AND CHEMICAL TREATMENT



The irregularities of data in Table 2 and of the curves in Figure 1 show that the susceptibility of a Ribes crown to decapitation and chemical treatment cannot be attributed directly to size of crown, amount of live stem, or soil moisture alone. Data in Table 2, however, do show that the crowns which died had received a larger dosage of chemical per unit area of crown surface than those which survived. Crown coverage is believed to be the most important single factor affecting bush kill by the decapitation method.

On August 10, 1938 a check was made of the plots at Boggy Meadows, Sierra National Forest, in which R. roezli had been decapitated below the crown. No chemical was used on these decapitated crowns. Data for the two plots are shown in Table 3.

TABLE 3

RESULTS OF LOW DECAPITATION OF R. ROEZLI. TESTS[1] MADE AT BOGGY MEADOWS, SIERRA NATIONAL FOREST, CALIFORNIA, 1937

Tool Used	Number of Small Bushes Removed In 1937	Number of Large Bushes Decapitated in 1937	Number of Large Bushes Missed	Number of Small Bushes Missed	Number of Layer Re-sprouts	Number of Small Bush Re-sprouts	Total Old Bushes	1938 Seedlings
Mattock	117	85	1 (150 FLS)	20 (52 FLS)	13 (24 FLS)	7 (16 FLS)	41	452
Pulaski	122	23	0	8 (39 FLS)	7 (18 FLS)	14 (94 FLS)	29	232

1/ Each plot 33 by 66 feet.

Of 108 large bushes decapitated in 1937 only one sprouted the following year. The efficiency of the work on small bushes, however, was not satisfactory. Numerous small bushes appeared to have been missed. In the majority of cases resprouts were coming up from pieces of layering stem which had been overlooked after the main crown had been cut out. The method is not recommended on areas where layering stem is prevalent, but it should be further tested on areas where the bush crowns are large and clearly defined.

Oil and Hand Eradication Methods Tests on R. roezli Seedlings

The oil and hand eradication plots on R. roezli seedlings, Chowchilla Mountain, Sierra National Forest, were checked July 5 to 25. For details of treatment see pages 119-129 of the 1937 annual report.

Because of the limited personnel available for the checking work and the large size of the plots, it was impractical to make a 100 percent check of the test areas. Milacre samples of plots 10, 14, 15, and 3 square chains of plot 20 were checked. Missed bushes and bushes which had survived

chemical treatment were present in large numbers on all plots. Bush kill averaged between 50 and 75 percent with the better kill on areas which had been sprayed by the best workers.

More 1938 seedlings came in on oiled strips (plot 10) than on strips worked with garden hoes. Possibly the hoeing buried part of the seeds too deep for germination to take place, or sublethal dosages of oil caused increased germination.

On the pick and oil comparison plot (plot 15) there was no appreciable difference in the number of 1938 seedlings present. Some seedlings were covered over at time of digging and consequently missed, but there was no evidence that dug seedlings had taken root and survived. The same observation was made for the hoeing work.

Observations of the tests at Bear Tallow showed favorable results from the use of the barrel pressure sprayer. In this work a pressure of 15 to 20 pounds per square inch had been used for spraying. Most of the small bushes had been killed, due, doubtless, to a greater output of oil, and to better coverage provided by the highly vaporized spray.

Two general conclusions have been made from the results of the 1937 methods tests on R. roezli seedlings. They are: (1) the grades of Diesel oil now commercially available are not toxic enough for spray work unless applied in quantities which are now believed to be economically impractical; (2) the type of labor available for large scale work requires more supervision than has been given to it, and objectives of the work undertaken by this class of labor must be made practical rather than technical. These two considerations were given special attention in planning and executing the 1938 work.

The Effect of Diesel Oil on the Viability of Ribes Seed

The six milacre oil plots established at Boggy Meadows, Sierra National Forest, on October 18, 1937 were inspected August 10, 1938. No seedlings were found on the 5,000 and 3,000-gallon dosage per acre plots. A few seedlings were found on the lighter dosage plots. Data from these plots cannot be taken as significant because the unfenced plots had been heavily trampled by cattle. Studies on this problem were continued in 1938, and additional data will be available after the plots have been checked in 1939.

FIELD TESTS IN CALIFORNIA FOR 1938

Decapitation Tests on R. nevadense and on R. cereum

On June 8, a small plot of R. nevadense was located near an old power logging skidway about 2 miles west of Poison Meadow, Sierra National Forest, in sec. 25, T. 6 S., R. 22 E. The area was heavily grazed and many crowns were buried to a depth of 8 to 12 inches in soil and old logging debris, making it difficult to secure thorough coverage of all crown tissue with chemical. Treatment was further impaired by having to use a sodium thiocyanate which had become damp through winter storage.

Forty bushes were treated with the following dosages: 29 - 2 oz.; 3 - 3 oz.; 1 - 4 oz.; 2 - 6 oz.; 1 - 8 oz.; and 4 controls.

On July 7 a crew of 4 men put out 50 pounds of sodium thiocyanate on about 150 to 175 decapitated R. nevadense on Chowchilla Mountain, sec. 15, T. 5 S., R. 21 E. The bushes were very large and grew in dense brush. Under these conditions the decapitation and chemical treatment took more time than was considered to be practicable for such work. The remaining bushes on the same area were later blasted out with dynamite.

On July 30 a small plot of R. cereum bushes was established near Beasore Meadow, Sierra National Forest, sec. 34, T. 5 S., R. 23 E., about 1 mile east of the store and camp ground. Seventeen bushes growing in the open were decapitated with long-handled shears and treated with a mixture of Diesel oil (1 part) and light crude oil (1 part). The size of the crowns and the conditions under which they occurred are shown in photographs 1 to 6. Dosages varied from 1/3 gallon to 1-3/4 gallons for bushes having 250 to 4,000 feet of live stem. Some crowns had a spread of 6 square feet. Six man-hours were spent on the plot. In 1939 dynamite will be tried on similar large bushes wherever they grow in open country or brush. Chemical, however, seems to be more practicable than dynamite for the eradication of rockbound bushes.

The Eradication of Large Intact R. roezli by Means of Oil

On August 12 and 13, an oil plot was established at Boggy Meadows, Sierra National Forest, on which 1 pint of oil each was applied to the crowns of some 536 intact R. roezli. Straight Diesel oil 32° Bé, and a mixture of Diesel oil 1 part and 1 part SO_2 extract were used. The SO_2 extract is made from lubricating oils and contains both aromatic and sulphur compounds. Pressure sprayers with the nozzle removed from the delivery pipe were used. Experience showed that the most troublesome bushes to treat were those having a great number of small canes and those having considerable layering stem. The method is well adapted to the treatment of large bushes having a well defined central crown. Such bushes could be treated when growing in brush without the necessity of slashing the brush as is the practice in hand eradication.

1, 3, 4, 5 and 6 large R. cereum bushes decapitated and oiled with a mixture of Diesel oil 1 part plus furnace oil 1 part. Beasore Meadow, Sierra N. F., Calif. 2. Control, showing sprouts from crown three months after decapitation. Dynamite can be used effectively for removing large ribes in non-rocky sites such as those shown in 1, 2, 3 and 4

Toxicity Tests on New Oil Mixtures for R. roezli Seedlings

Preliminary tests. - Inspection of the 1937 spray work on *R. roezli* seedlings on Chowchilla Mountain, Sierra National Forest, California, showed the need for a more toxic material than the highly refined Diesel oils now being furnished to the trade. From previous experience it was known that the toxicity of old type black Diesel oils was in a large measure due to their sulphur and aromatic ingredients.

After discussing the toxicity problem with the research chemists of the Standard Oil Company of California at Richmond, California, it was found that an SO_2 extract obtained as a byproduct during the refining of lubricating oils was available at the refinery and that the oil was rich in the desirable aromatic and sulphur compounds. This byproduct can be obtained in grades having a wide variation in chemical and physical properties. For Ribes eradication work an oil was specified that would be miscible with Diesel oil in all proportions, wax-free, salt-water-free, free of solid materials larger than 50 mesh, free of abrasive materials; it was further specified that the oil should have a viscosity not less than that equivalent to a flow time of 39 Saybolt seconds at 50° F. (4.44° C.). An oil of this viscosity would be suitable for spraying at any temperature encountered during the summer field season.

All samples of the SO_2 extract met these general specifications and were furnished free of charge by the Standard Oil Research Laboratory.

On July 22, a 25-gallon sample of the SO_2 extract was used in a series of preliminary tests on *R. roezli*. Data for these tests are given in Table 4.

TABLE 4

PRELIMINARY TESTS OF NEW OIL MIXTURES ON R. ROEZLI, CHOWCHILLA MOUNTAIN, SIERRA NATIONAL FOREST, CALIFORNIA, 1938

Plot Number	Date	Oil Mixture Used	Gallons Used	Bushes Treated	Method of Application
1	7/22	SO_2 Ext. + Diesel Oil (1:1)	30	1,065	Complete coverage + crown treatment
2	7/22	SO_2 Ext. + Diesel Oil (4:5)	9	930	Crowns only
3	7/22	100% SO_2 Ext.	5	400	Crowns only
4	7/23	Crude Oil + Diesel Oil (1:1)	15	1,500	Crowns only (large Bushes)

Although data on bush kill cannot be obtained until the year following treatment, tentative results showed enough promise to warrant further tests. One hundred gallons of SO_2 extract were then applied in various dosages. Diesel oil 29° + Bé was used as a control since it has proven ineffective when applied in small doses.

Two types of plots were established: (1) individual or selective treatment of bushes by the heavy, medium, and light dosages as used in 1937 on seedling plot work, and (2) soil drench or broadcast treatment wherein all of the plot area was evenly sprayed with a given quantity of oil.

Selective treatment. - On August 3 and 4 twenty-two 1/4 square chain plots were laid out and treated with varying dosages of SO_2 extract and Diesel oil. Data for plot treatment are given in Table 5 and a diagram and location of the plots are shown in Figure 2.

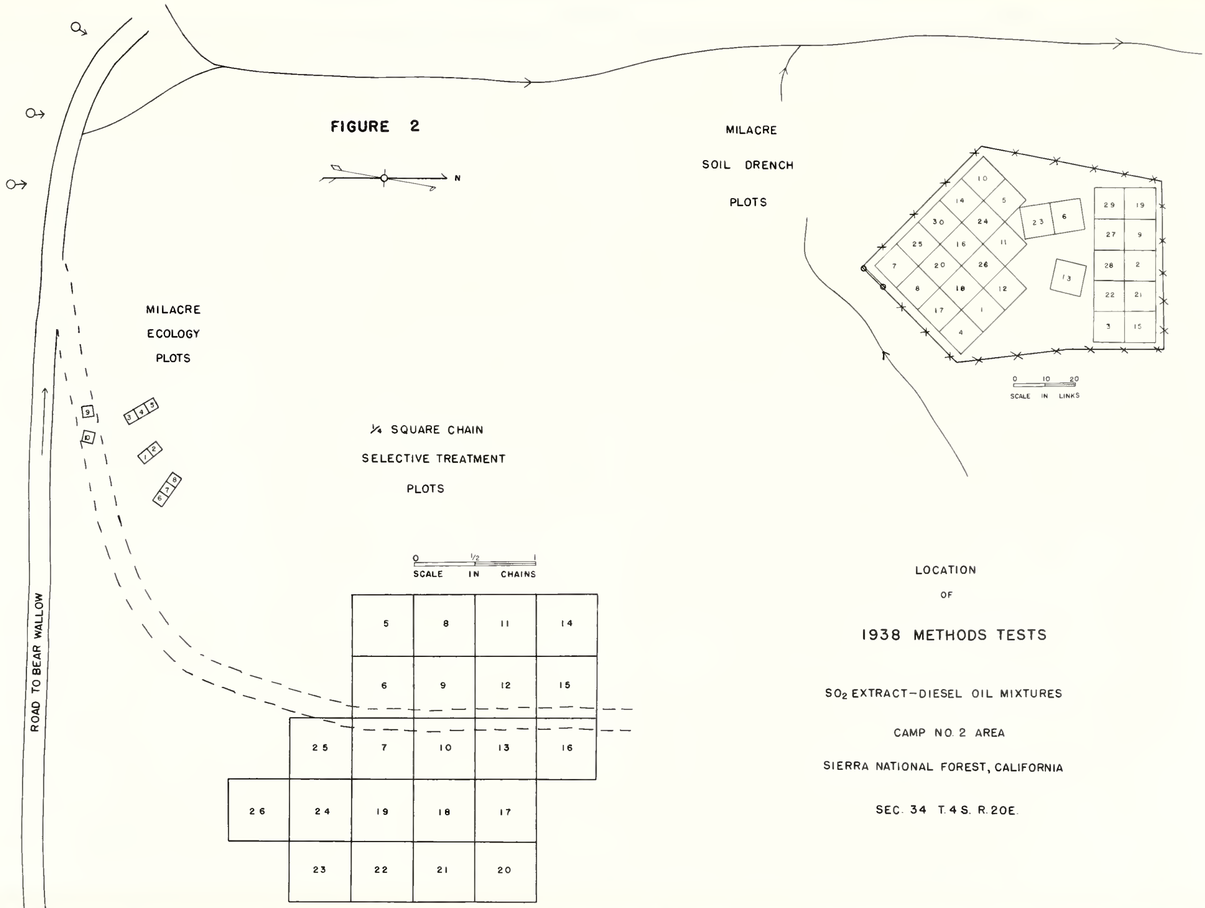

N
MILACRE
SOIL DRENCH
PLOTS
0 10 20
SCALE IN LINKS
MILACRE
ECOLOGY
PLOTS
¼ SQUARE CHAIN
SELECTIVE TREATMENT
PLOTS
0 ½ 1
SCALE IN CHAINS
ROAD TO BEAR WALLOW
LOCATION
OF
1938 METHODS TESTS
SO_2 EXTRACT–DIESEL OIL MIXTURES
CAMP NO. 2 AREA
SIERRA NATIONAL FOREST, CALIFORNIA
SEC. 34 T. 4 S. R. 20 E.

FIGURE 2

TABLE 5

SELECTIVE TESTS OF NEW OIL MIXTURES ON R. ROEZLI, CHOWCHILLA MOUNTAIN, SIERRA NATIONAL FOREST, CALIFORNIA, 1938

Plot 1/ Number	Date of Treatment	Number of Bushes Treated	Gallons Used Per Plot	Percent SO_2 Extract Added to Diesel Oil	Type of Treatment
5	Aug. 3	508	9	10	Heavy 2/
6	"	425	5	10	Medium 3/
7	"	550	7 1/2	10	Light 4/
8	"	490	8 1/2	20	Heavy
9	"	650	8	20	Medium
10	"	580	7 1/2	20	Light
11	"	900	15	30	Heavy
12	"	640	9	30	Medium
13	"	812	14	30	Light
14	"	720	12	40	Heavy
15	Aug. 4	380	5	40	Medium
16	"	571	7 1/4	40	Light
17	"	500	10	50	Heavy
18	"	710	9 1/2	50	Medium
19	"	331	5 1/2	50	Light
20	"	300	6 1/2	0	Heavy
21	"	560	8	0	Medium
22	"	552	8 1/2	0	Light
23	"	240	4	5	Heavy
24	"	257	4	66 2/3	Light
25	"	300	3	80	Light
26	"	312	4	100	Light

1/ All plots 1/4 square chain in size.

2/ Heavy application, complete bush coverage and additional oil on crown.

3/ Medium application, complete bush coverage.

4/ Light application, crown coverage only.

Broadcast treatment. - On August 11 and 12, thirty milacre plots were laid out, fenced, and sprayed with various dosages of SO_2 extract, Diesel oil, and crude oil by the soil drench, or broadcast method. The location and layout of these plots are shown in Figure 2. The objectives of these plots were: (1) to establish the dosage of Diesel oil, Diesel oil plus SO_2 extract, Diesel oil + crude oil, and SO_2 extract, needed for partial to complete kill of young R. roezli, (2) to determine the effect of different dosages of the four oil mixtures on the viability of Ribes seed, and (3) to correlate field spraying methods with actual dosage figures on a per acre basis.

The locations of the control and oil plots were randomized by drawing plot numbers from a hat.

The plot area was fenced for protection against cattle. Data for these plots are given in Table 6.

TABLE 6

BROADCAST TESTS OF NEW OIL MIXTURES ON R. ROEZLI, CHOWCHILLA MOUNTAIN, SIERRA NATIONAL FOREST, CALIFORNIA, 1938

Plot Numbers	Number of Bushes on Plot	Dosages in Gallons Per Milacre			
		SO_2 Extract	SO_2 Extract + Diesel Oil (1:1)	Diesel Oil + Crude (1:1)	Diesel oil
1	43	1.0	-	-	-
2	105	1.5	-	-	-
3	55	2.0	-	-	-
4	70	3.0	-	-	-
5	137	5.0	-	-	-
6	94	10.0	-	-	-
7	18	-	1.0	-	-
8	79	-	1.5	-	-
9	64	-	2.0	-	-
10	56	-	3.0	-	-
11	53	-	5.0	-	-
12	35	-	10.0	-	-
13	58	-	-	1.0	-
14	94	-	-	1.5	-
15	21	-	-	2.0	-
16	109	-	-	3.0	-
17	108	-	-	5.0	-
18	65	-	-	10.0	-
19	63	-	-	-	1.0
20	210	-	-	-	1.5
21	23	-	-	-	2.0
22	46	-	-	-	3.0
23	127	-	-	-	5.0
24	133	-	-	-	10.0
25	209	None	None	None	None
26	25	None	None	None	None
27	170	None	None	None	None
28	195	0.5	-	-	-
29	57	-	0.5	-	-
30	-	None	None	None	None

Methods Tests With the Eradication of R. roezli Seedlings by Oil

In the continuation of developmental work on the oiling of *R. roezli* seedlings, tests were made of new oil mixtures and of methods of equipment for distributing and spraying oil.

Type of oil used and methods of storage and transportation. A mixture of crude oil and Diesel oil blended to a gravity of approximately 27° + Bé was prepared, the crude oil being incorporated to obtain the sulphur and aromatic ingredients considered necessary for a toxic spray.

A 2,200-gallon galvanized iron, covered tank was borrowed from the Forest Service warehouse at Northfork, California, and installed at Summit Camp six miles from the nearest paved road at Fish Camp. This receiving tank was placed so that it could be filled and emptied by gravity.

The oil was drawn from the tank into 50-gallon drums and transported via pickup truck to a roadside filling station close to the job in the field. Five-gallon tin cans were used for carrying the oil from the filling station to place of use. A standard packboard was fitted with a wooden step on which one 5-gallon can of oil was held in place by a single strap. The complete unit, filled, weighed about 40 pounds. The oil packers spotted the oil over the area where it could be conveniently reached by the spray crews. The packers soon learned to judge by the number of Ribes present how much oil to leave at one place.

Spray equipment and crew technique. A 3-gallon pressure sprayer of the type designed by Breakey for use on *R. petiolare* rework was used in all the methods tests for oiling *R. roezli*. At first all members of the crew carried a tank; later the crew leader carried a standard eradication pick and the two other crewmen carried spray tanks. The crew leaders' duties were (1) to dig or decapitate all large bushes left from 1935 hand eradication, (2) to lift brush and remove trash and litter which interferred with spraying, and (3) to check the work of the sprayman and to dig missed and poorly sprayed bushes.

Location of 1938 methods tests and procedure for selecting and laying out plots. The area used for the spraying tests was in section 34, T. 4S., R. 20 E., in the vicinity of Camp 2, Chowchilla Mountain, Sierra National Forest, California. The Ribes on the remainder of section 34 and the balance of sections 27 and 35 were grubbed by eradication crews working out of Camp 2.

Spraying data were recorded so that correlations with eradication and checking data could be readily made. This was achieved as nearly as possible by having the checking organization run a 5 percent post check on the area. Post check figures were computed on a per acre basis, and from these figures a map was prepared showing seedling density by 5-chain transects. The entire area was then subdivided by inspection into plots of varying seedling density, care being taken to keep boundary lines in cardinal directions and to include the largest possible area for each density classification. The manner in which the entire area was subdivided is shown in Figure 3.

Later the boundaries of the plots were located by colored string run in by staff compass, Abney hand level, and topographic steel trailer tape.

In an attempt made to subdivide the areas so that a wide range of Ribes densities would be available, the following classifications of Ribes on a per acre basis were set up: (0 - 50), (51 - 100), (101 - 200), (201 - 400), (401 - 800), (801 - 1600), (1601 - 3200), (3201 - 6400), (6401 - 12,800).

Data were kept separately for each density block in each section, the general working plan being to use the available stock of oil for spraying the heaviest concentrations of seedlings. The remainder of the experimental plots were to be worked by hand eradication.

The allocation of the various plots to chemical or hand work was made on the assumption that the curves for man days per acre by hand and chemical methods would intersect. Figure 4, plotted on 5-cycle, semilog paper shows these curves to intersect at about 3,000 Ribes per acre (post check figures). This is the theoretical point at which oiling begins to show a saving of time over hand eradication. By expressing the cost of oil per acre for various Ribes concentrations (Table 7) in terms of man days of labor, it is possible to determine on the curve shown in Figure 4 the "cost point" above which it would be more economical to use an effective oil spray.

TABLE 7

COST OF OIL PER ACRE BY RIBES DENSITY. METHODS TESTS WITH THE ERADICATION OF R. ROEZLI SEEDLINGS BY OIL, CHOWCHILLA MOUNTAIN, SIERRA NATIONAL FOREST, CALIFORNIA, 1938

Ribes Per Acre	Gallons of Oil Used Per Acre	Cost of Oil Per Acre
1938 Post Check - 3,825	43.60	$3.72
1937 Post Check - 1,078	37.75	3.22
" - 220	27.60	2.35

B 81. Oil crew at work on R. roezli seedlings, Sierra N. F., Calif. Note the manner in which the Ceanothus bush must be inspected for ribes. B 82. Details of the 3-gallon compressed air sprayer. The R. roezli seedling left foreground has just been treated. B 80. Three-man crew of oilers treating R. roezli. The foreman (in rear) grubs missed or improperly oiled bushes.

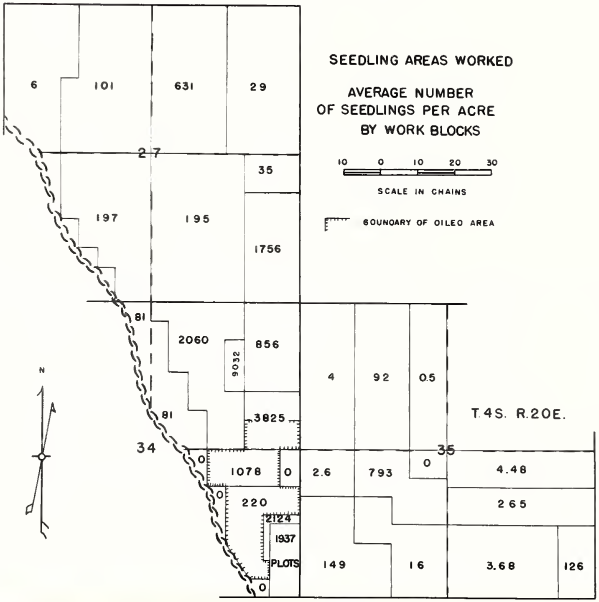
LOCATION

OF

1938 METHODS FIELD TRIALS

SIERRA NATIONAL FOREST, CALIFORNIA

R. ROEZLI SEEDLINGS, CAMP NO. 2 AREA



METHOD OF LOCATING
SEEDLING BLOCK BOUNDARIES

CHECK STRIP FIGURES ON A
PER ACRE BASIS BY 5 CHAIN TRANSECTS

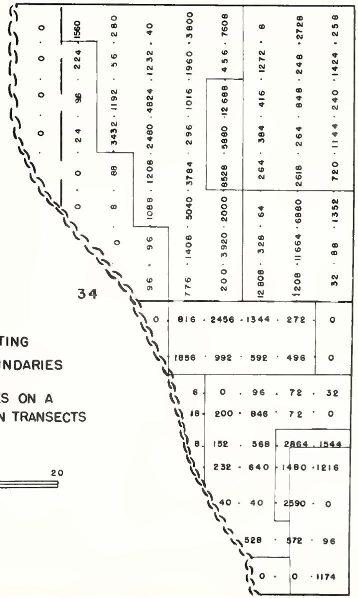


FIGURE 3

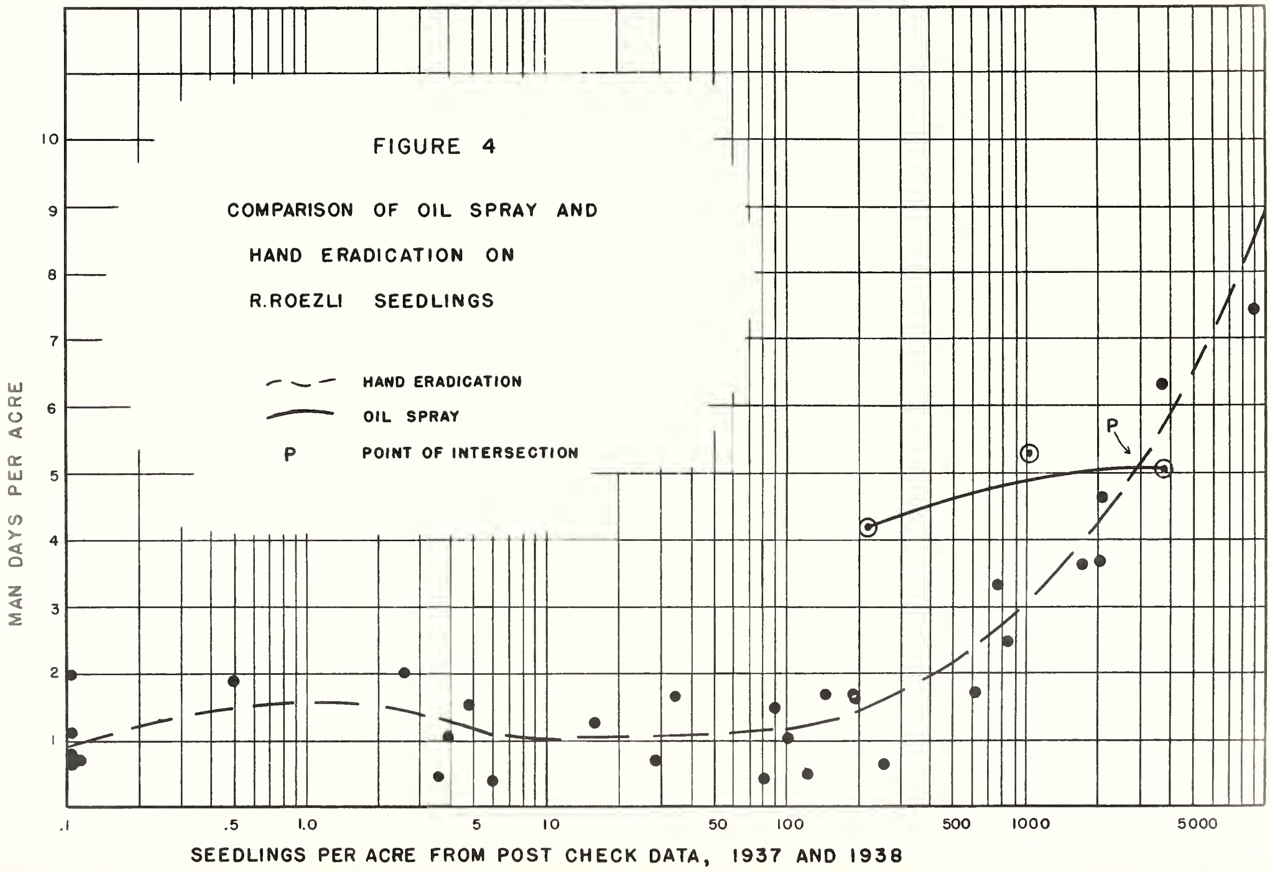


FIGURE 4
COMPARISON OF OIL SPRAY AND
HAND ERADICATION ON
R.ROEZLI SEEDLINGS
HAND ERADICATION
OIL SPRAY
P POINT OF INTERSECTION
P
MAN DAYS PER ACRE
10
9
8
7
6
5
4
3
2
1
.1
.5
1.0
5
10
50
100
500
1000
5000
SEEDLINGS PER ACRE FROM POST CHECK DATA, 1937 AND 1938

The Use of Dynamite for Eradicating R. nevadense

On the Sierra National Forest R. nevadense often grows to a height of 6 to 8 feet in heavily vegetated draws where whitethorn (Ceanothus cordulatus) and underbrush seriously impede the movement of eradication crews. Under these conditions a solid mat of brush roots combined with nearly impenetrable surface stems make it difficult to remove Ribes crowns and buried stem tissue.

Bulldozer, chemical, and dynamite were considered in connection with the development of methods for eradicating these troublesome Ribes. Due to the precipitous character of the side slopes of the draws and rocky nature of the soil, the use of a bulldozer seemed impracticable. The use of Atlacide was ruled out because of the high fire hazard, and oil was considered impracticable because of the large size of the bushes and the difficulty of transporting such a bulky spray material as oil through dense brush. Decapitation with chemical treatment of crows was tried, but it soon became apparent that the time consumed in locating the crown, cutting off the bush top, and covering the crown surface with chemical was in many cases nearly as great as in regular digging. The buried stems of the Ribes made it difficult to get crown coverage without practically clearing the land of all vegetative growth. At the suggestion of F. A. Patty and Arthur London, stumping powder was used for blasting out the Ribes crowns. The method appeared to be effective and a crew of experienced powder men was detailed to give the method a thorough trial.

Use of Powder

(a) Crew: A 2-man crew was used. One man located the Ribes crown and with a heavy steel bar made a hole from 12 to 18 inches deep beneath the crown. The other man prepared the powder and loaded the holes.

(b) Powder: One 1/2-pound stick of 20 percent powder was used per bush.

(c) Detonation: Six-foot electric caps were used, the shots wired in series and set off 6 to 12 at a time by means of a hand-turned magneto detonator.

(d) Effectiveness: The 2-man crew averaged 100 large crowns per day, only the largest and more difficult bushes being blasted. The powder had to be placed below the crown for an effective shot. Blasting opened up the area and made the follow-up hand work much easier. The powder was most effective in wet soil.

(e) Cost: A cost of 21-1/5 cents per bush for large bushes was computed while a conservative estimate indicated a saving of at least half the cost involved in doing the same amount of work by hand methods.

Powder	$7.50 per 100 lbs. (1/2-lb. sticks)
Caps	4.00 per 100
Labor	6.73 per man day

At 100 bushes per day for 2-man crew:

Powder	$ 3.75
Caps	4.00
Labor	13.46
	$21.21

21.21/100 = 21-1/5 cents per bush

Since the small bushes were not treated with powder they have to be eradicated by the usual hand methods when the area is later put in readiness for a regular check.

Tentative Conclusions on the Merits of Blasting for the Removal of Large *R. nevadense*

Advantages:

(a) Cheaper than other methods tried.
(b) Opens up area so further work is much easier.
(c) Partially blown-out bushes are badly shattered and usually die.
(d) *R. nevadense* grows in wet sites where powder is most effective.

Disadvantages:

(a) Cost is still too high for low value pine areas, or for areas of high Ribes concentration.
(b) Experienced, skillful, cautious men are required.
(c) A certain amount of fire hazard is involved.
(d) There is danger of death or serious injury through carelessness or accident.
(e) Pack horses will have to be used on some areas.
(f) Not too effective on extremely rocky sites unless a prohibitive amount of powder is used.
(g) The possibility of soil erosion following Ribes eradication with dynamite must be considered. On logged-off land where soil erosion has not occurred it is tentatively assumed that dynamite will not create an erosion problem. On logged-off land where soil erosion has been severe, eradication with dynamite may create conditions ideal for erosion and such areas should be carefully watched. The stream-type areas near Fish Camp, Sierra National Forest, California, which were worked by means of dynamite in 1938 should not present a serious erosion problem due to the dense vegetative cover remaining after eradication. The blasting was done at the bottom of the V of small gullies and usually near bedrock.

Recommendations for Future work

Further consideration of this method should be made to determine (1) cost for various types of work; (2) effectiveness for various types of country; (3) time of year for most effective work; (4) best crew practices; (5) proper kind of powder for various soil conditions; (6) the extent to which blasting may cause soil erosion.

Trial of the Ribes Grapple on R. roezli, Sierra National Forest, California

The success achieved by C. P. Wessela in the use of a horse-drawn hook-grapple for pulling large R. cereum led to an attempt to adopt the method for working concentrations of large R. roezli in California.

A previous description of this grapple and its use is given on page 120 of the 1934 annual report on blister rust control for the western States.

Preliminary trials. At the suggestion of W. V. Benedict, a duplicate of the Oregon tool was made in the Forest Service shops at Medford, Oregon. On September 28 this grapple shown in photograph B 107-1 was tried at Boggy Meadows, Sierra National Forest, California, the test being made on large R. roezli growing on level ground in fairly loose soil. One 1,500-lb. horse was used. The grapple was effective on any Ribes bush which the single horse could pull. About two to five percent of the bushes were rooted too firmly to be removed by a single horse.

On October 20 to 22, at Yosemite Mountain Ranch, the same grapple was used with two horses, each weighing 1,500 pounds. Although the ground was harder than at Boggy Meadows, and more grass, logging debris, and brush were present, the team of horses did satisfactory work. When the grapple properly engaged the Ribes crown, the roots broke off well down in the ground, as shown in photograph B 107-5. In some cases, however, when the Ribes crown was not properly hooked, some crown tissue would be left in the ground. Tap-rooted R. roezli having long roots were difficult to engage with the two-toothed grapple because of the narrow spread of 5-1/2 inches between the ends of the teeth.

A four-foot length of 3/8-inch steel cable with iron rings spliced into the ends was used as a hitch for most of the trials. For special conditions a 15-foot cable was used. This long hitch enabled the operator of the grapple to work between brush clumps where the team could not maneuver. Ribes growing under the edge of a Ceanothus bush were best pulled by throwing the long cable over the brush clump and pulling over and across. This worked better than grappling the Ribes with a side pull along the brush clump.

The grapple with a long cable hitch worked well as an accessory tool for rolling and dragging down logs which interferred with the work. An illustration of this technique is given in photograph B 107-6. The rolling pull makes it possible for a team of horses to move most of the logging debris ordinarily encountered.

Rooting Habits of R. cereum and R. roezli. A comparison of the rooting habits of R. cereum and R. roezli is pertinent to the discussion of the effectiveness of the grapple. R. cereum, growing in the loose pumice soil of southern Oregon, is characterized by a root system which branches widely from the crown. When more than one crown is found in a single clump, the roots and crows are so interlocked that all may be removed in one pulling operation provided the crowns are properly grappled. Equally satisfactory results have not been obtained with R. roezli because (1) in many cases R. roezli has a tap-root extending down for about one foot before extensive lateral branching begins, (2) where R. roezli

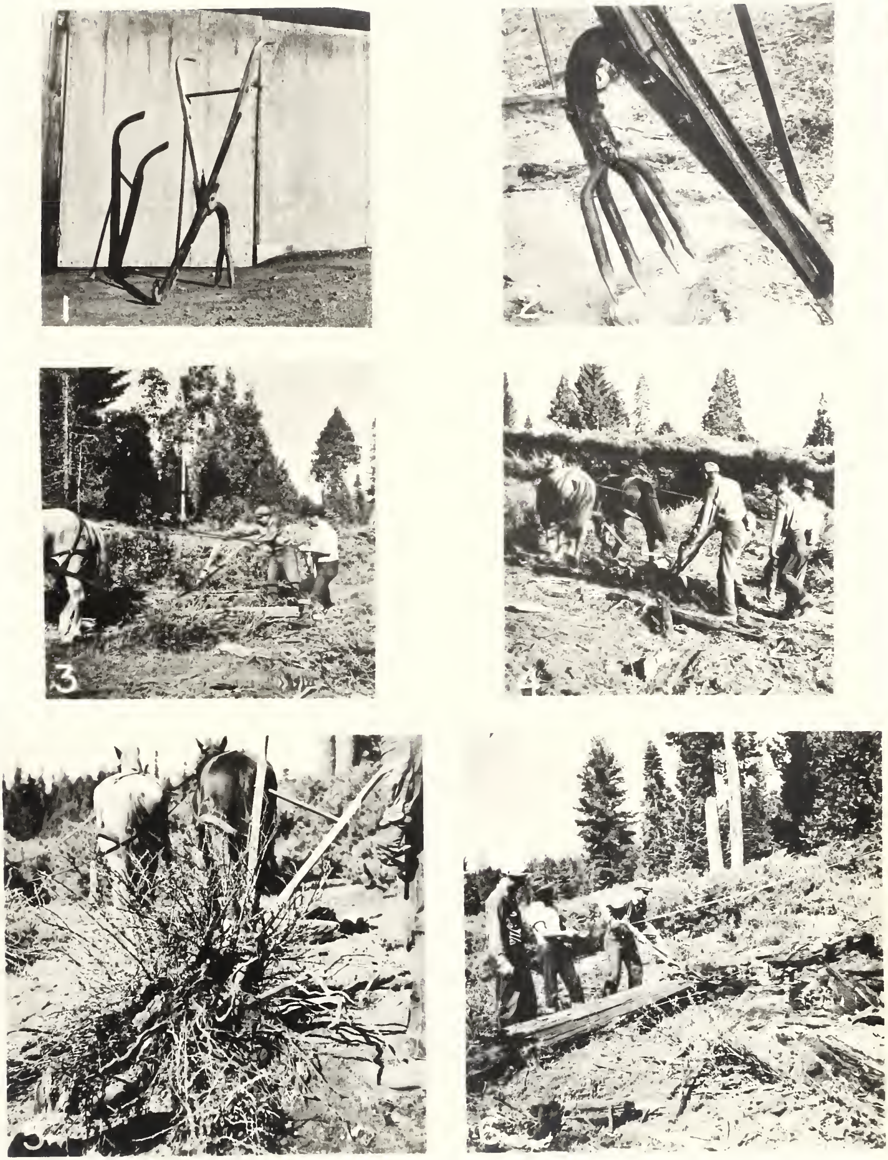
are found in clumps of several crowns, the roots are either not so intergrown as R. cereum or they are more deeply rooted. In some instances the root growth is very similar to that of R. cereum. This type of R. roezli can be readily pulled. In sod or very hard ground it is difficult to thrust the short-beamed Oregon tool deep enough into the ground to hook the bush at the proper point, i.e., a few inches below the crown.

New grapples designed. The suitable grapple for R. roezli seemed to be one having 3 or 4 teeth with a point spread of from 8 to 10 inches. The beam should be long enough (about 3-1/2 ft.) to give the necessary leverage in sod or hard ground. Two such tools were constructed, one with 4 teeth eight inches long (photograph B 107-2) and a point spread of ten inches, and one with 3 teeth eight inches long and a point spread of seven and a half inches. These tools were tried out with an Indiana White 2-1/2 ton truck to furnish the power. Results were satisfactory; the bushes were readily engaged and no difficulty was experienced setting the teeth into the soil.

A 3-toothed attachment resembling a crow's foot was tried out and proved to be an absolute failure. The teeth should be shaped like a pitchfork, as shown in photographs B 107-1 and 107-2, in order to enter the ground and engage the bush effectively.

Present plans call for an extensive trial of both tools as early as possible in the 1939 field season.

The Forest Service of Region 5 has offered the services of their Mechanical Engineering Department, and E. A. Meldrum is now working on the structural strength necessary in a minimum weight tool of this type.



B 107 1. Oregon ribes grapple 2 Modified grapple for work on R roezli. 3, 4, and 5 Two-horse team at work on R roezli, Yosemite Mountain Ranch, Sierra N F, Calif. 6. Using the plough to roll an interferring log away from R. roezli crowns.

FIELD TESTS IN OREGON FOR 1938

Methods work in Oregon for 1938 was done during the period August 16 to September 16 and included: (1) establishment of the lethal dosage of Diesel oil for the eradication of R. binominatum, (2) decapitation tests on R. bracteosum, and treatment of crowns with concentrated solutions of ammonium or sodium thiocyanate, (3) collection of soil samples and Ribes seeds for germination tests.

Broadcast Treatment of R. binominatum

It was impossible to obtain crude oils in Medford or its immediate vicinity; consequently Diesel oil was blended with light furnace oil to a specific gravity of 25° to 27° Bé for use in spray work.

Plots were located on the south slope of Roundtop Mountain, sec. 27, T. 31 S., R. 2 E., Rogue River National Forest, Oregon, about 2 miles from Buck Basin Camp (Figure 5).

On August 24 and 25 oil in 5-gallon cans was taken to the plot location by pack horses. The plots were staked out and sprayed August 26-31. All spraying was done with the same pressure sprayers used on R. roezli seedlings in California. Data for these tests are shown in Table 8.

TABLE 8

BROADCAST TREATMENT OF R. BINOMINATUM, ROUNDTOP MOUNTAIN, ROGUE RIVER NATIONAL FOREST, OREGON, 1938

Plot No.1/	Density of Ribes in Percent	Feet of Live Stem	Dosage in Gallons Per Square Rod: Diesel Oil + Furnace Oil (1 : 1)	Diesel Oil + SO_2 Ext. (3 : 1)	Diesel Oil + Furnace Oil (3 : 2)	Min. to Spray or Grub	Number of Bushes Grubbed
1	20	400	-	15	-	75	-
2	15	300	-	10	-	60	-
3	20	600	-	7	-	40	-
4	20	600	-	5	-	25	-
5	30	600	15	-	-	75	-
6	50	800	10	-	-	60	-
7	15	200	7	-	-	40	-
8	15	250	5	-	-	25	-
9	50	600	15	-	-	-	-
10	30	400	10	-	-	-	-
11	10	150	7	-	-	-	-
12	10	150	5	-	-	-	-
13	25	350	15	-	-	-	-
14	40	500	10	-	-	-	-
15	10	200	7	-	-	-	-
16	10	200	5	-	-	-	-
17	25	400	-	-	15	-	-
18	20	300	-	-	10	-	-
19	15	250	-	-	7	-	-
20	10	200	-	-	5	-	-
21	15	250	-	-	15	-	-
22	10	150	-	-	10	-	-
23	20	300	-	-	7	-	-
24	10	200	-	-	5	-	-
25	30	300	-	-	15	-	-
26	40	500	-	-	7	-	-
27	30	400	-	-	2/	-	-
28	30	350	-	-	2/	-	-
29	10	150	-	-	-	21	54
30	50	600	-	-	-	54	261
31	60	600	-	-	-	81	175
32	30	400	-	-	-	39	207
33	30	350	-	-	-	51	229
34	60	700	-	-	-	60	317

1/ Plots 9-12, 17-20, and 25-26 had litter and decayed wood removed. Plots 1-8, 13-16, and 21-24 were sprayed without doing any preparatory work to the ground surface.

2/ Controls.

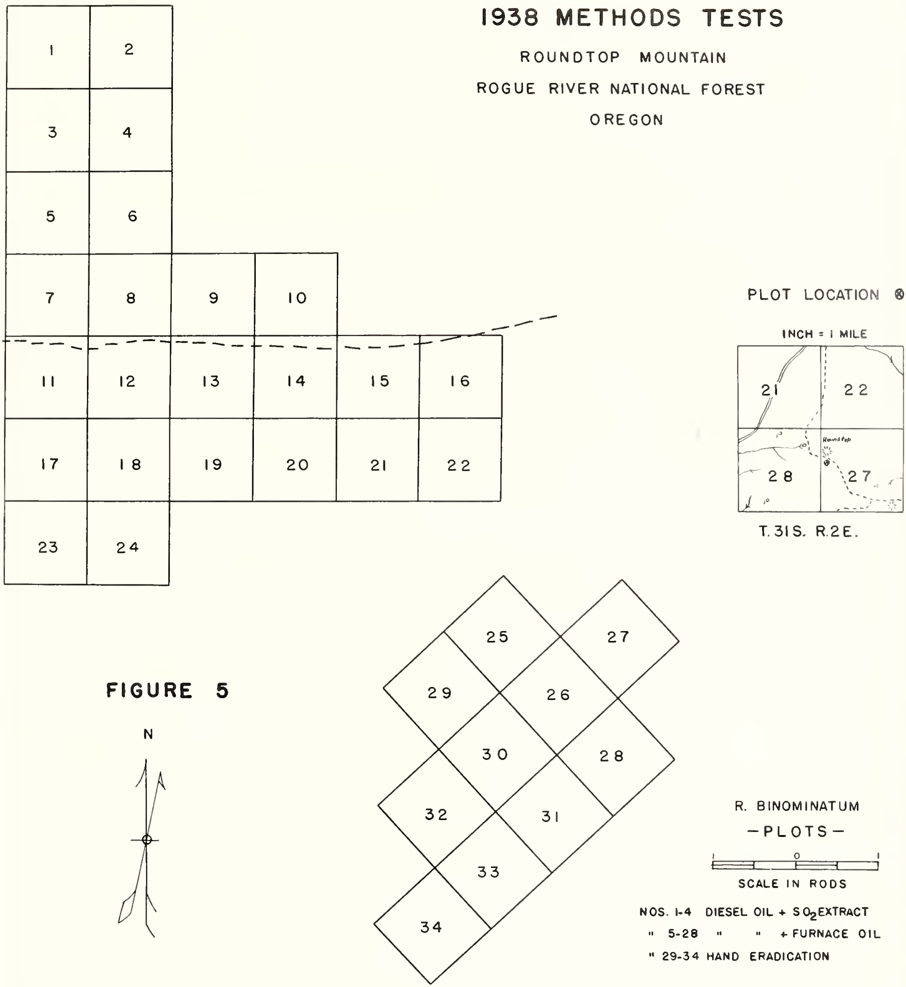

1938 METHODS TESTS
ROUNDTOP MOUNTAIN
ROGUE RIVER NATIONAL FOREST
OREGON
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
PLOT LOCATION ⊗
INCH = 1 MILE
21
22
28
27
T. 31 S. R. 2 E.
25
27
29
26
30
28
32
31
33
34
N
R. BINOMINATUM
– PLOTS –
1
0
1
SCALE IN RODS
NOS. 1-4 DIESEL OIL + SO_2 EXTRACT
" 5-28 " " + FURNACE OIL
" 29-34 HAND ERADICATION

FIGURE 5

Decapitation and Chemical Treatment of R. bracteosum

On September 14 and 15 the decapitation and chemical treatment of _R. bracteosum_ was compared with hand eradication in a small scale field trial. The work was done on the Buck Creek Fork of Muir Creek, Rogue River National Forest, Oregon. The objectives of the test were: (1) to determine the effectiveness of concentrated solutions of ammonium and sodium thiocyanate on the decapitated crowns of _R. bracteosum_, and (2) to compare the speed of grubbing and chemical work on _R. bracteosum_.

The work was done by crews from Bureau Camp 3. Chemical had to be carried about 1/2 mile on packboards. Five-gallon knapsack tanks with open end delivery pipes were used for application of the chemical.

Packing time was not included as it is considered inaccurate from a comparison basis unless the scope of the work is large enough to utilize all men and equipment at maximum efficiency.

Since several members of the crew would be out of place in any sort of an economic unit, the time comparison figures shown in Table 9 have little practical value. The relative merits of the two methods should be judged on the effectiveness of the work rather than on the time records given in Table 9.

TABLE 9

THE ERADICATION OF DECAPITATED R. BRACTEOSUM BY CHEMICAL AND HAND METHODS, BUCK CREEK, ROGUE RIVER NATIONAL FOREST, OREGON, 1938

Date of Treatment	Method of Eradication	Number of Bushes Eradicated		Total Man Hours	Gallons Chemical Used 1/
		Grubbed	Chemical		
Sept. 14-15	Hand	2,670	-	48	-
"	Ammonium thiocyanate	1,188	210	24	23
"	Sodium thiocyanate	300	158	16	16

1/ Dosage rate one pint per crown. The solutions as applied contained 4 lbs. of chemical per gallon of water.

Collection of Soil Samples

Twenty-four soil samples were collected for use in Ribes seed germination. These samples were taken from areas bearing typical stands of western white and sugar pine in the Rogue River National Forest, Oregon. Special emphasis was placed on the Ribes history for each site sampled.

Ribes Seed Collection

Several gallons of the following Ribes fruits were gathered for seed extraction for germination work: _R. lacustre_, _R. bracteosum_, _R. viscosissimum_, _R. lobbii_, _R. binominatum_, and _R. erythrocarpum_.

LABORATORY AND GREENHOUSE WORK AND SPECIAL ACTIVITIES, NOVEMBER 1937 TO APRIL 1938

Laboratory and greenhouse work and special activities undertaken at Berkeley, California during the winter of 1937-1938 included (a) continuation of Ribes seed germination tests, (b) testing of the affect of Diesel oil and sodium thiocyanate on the viability of Ribes seeds, (c) development of a new spreader for use with sodium chlorate sprays, (d) determination of procedures and costs of dyeing 2-1/2 pound cones of cotton twine, (e) routine care of greenhouse and Ribes garden, (f) preparation of a field key to the Ribes of the Sugar Pine Region, (g) preparation of special summaries of all investigative reports (Serial Nos. 1A to H and 1 to 96). For further details on these topics reference should be made to the following reports:

Serial No. 93
A field key to the Ribes of the California Sugar Pine Region. C. R. Quick

Serial No. 94.
Methods of dyeing cones of cotton twine. H. R. Offord and L. P. Winslow

Serial No. 95.
New spreaders for use with chlorate sprays. H. R. Offord and L. P. Winslow

Serial No. 96
The effect of sodium chlorate, borax, and mixtures of sodium chlorate and borax on the viability of Ribes seed. H. R. Offord, C. R. Quick, and L. P. Winslow

Papers published during 1938 include:

Notes on the genus Ribes in California. Clarence R. Quick. Madroño, vol. IV, No. 8, pp. 286-290 (1938)

Sodium secondary alcohol sulfates as spreaders for sodium chlorate herbicides. H. R. Offord and L. P. Winslow. Northwest Science 12, pp. 95-96 (1938)

STATUS OF SPECIAL METHODS FOR THE ERADICATION OF RIBES

The results of 1937 field work do not change the recommendations for the chemical eradication of Ribes given on pages 130 and 131 of the 1937 annual report. In 1938 modified spraying equipment was tested for treating R. roezli seedlings with oil, and two new oil mixtures were used in practical spray work on R. roezli. The results of the 1938 work should show whether WPA labor can be effectively used for oiling R. roezli seedlings. The practical oil work done on R. roezli seedlings in 1937 did not meet the standards of effective control work.

Further tests with dynamite will be needed to show the comparative effectiveness of dynamite and chemical for the eradication of large R. cereum and R. nevadense. Data now available indicate that dynamite will be cheaper than chemical for Ribes in non-rocky sites. Where bushes are rooted among large boulders, or in rock crevices, oil or dry chemical should be used as recommended on pages 130 and 131 of the 1937 annual report.

Preliminary tests of the horse-drawn Ribes grapple for eradicating R. roezli were encouraging and further developmental work with this type of tool is planned for next year. Plans have also been made to design and test a bulldozer for working heavy concentrations of mature R. roezli. Several claw-hammer mattocks for work on R. roezli were made from the Idaho design. These tools were not received with uniform approval by those who used them, but sufficient interest was manifested to justify further developmental work on these tools next year.

Developmental work in methods of Ribes eradication for the Sugar-Pine Region is now taking a mechanical rather than a chemical slant. With the present restrictions on the spending of money for other than wages, the large-scale use of chemicals is impractical. On the other hand, improved tools could be utilized extensively under the present fiscal regime.

RIBES ECOLOGY IN CALIFORNIA, 1938

Occurrence of Ribes Seedlings on Eradicated Areas

In 1938 the study on occurrence of Ribes on eradicated areas was extended by adding 10 milacre-plots on Chowchilla Mountain, Sierra National Forest. The new plots lie in the N. E. 1/4, sec. 34, T. 4 S., R. 20 E., about 3/4 mile northerly from Camp 2 (Signal Peak camp). The plots are closely grouped near the road to Bear Wallow on a gentle northerly exposure in cut-over timber, and are near the easterly edge of a rather extensive lupine swale. Ribes seeds have apparently been concentrated here by surface erosion and drainage. The moisture in the soil remains satisfactory for seedling growth throughout the summer and fall, thus favoring a rapid regeneration of R. roezli from seed. Some of the plots were selected for maximum seedling regeneration, while others with fewer seedlings were established for comparison. The section in which the plots are located was worked in 1935, and again in 1938. A large population of R. roezli was removed at each eradication.

The following series of seedling-occurrence plots have been described in earlier reports: (1) Plot E, Chowchilla Mountain, Sierra National Forest; (2) Plot F, Chowchilla Mountain, Sierra National Forest; (3) Cow Creek milacres, Stanislaus National Forest; and (4) Spanish Ranch milacres, Plumas National Forest. Table 10 gives a summary of the seedlings removed in 1938 from these previously established plots, as well as those removed from the 10 new milacres established on Chowchilla Mountain in 1938.

In addition to the seedlings of 1938 origin shown in Table 10, the following Ribes were removed from the new milacre plots on Chowchilla Mountain: 10,699 one-year-old seedlings; 116 two-year-old seedlings; and 7 three-year-old seedlings. The average Ribes population per milacre for the ten plots was 1,640. One milacre (#10) had a total of 4,246 seedlings removed from it at the initial check.

Plot B, of 28 milacres, Cow Creek area, Stanislaus National Forest, initiated in 1937, had 4,097 Ribes seedlings (of which 3,271 were CSS) removed in 1937, and 2,631 (of which 2,574 were CSS) removed in 1938. This plot was mapped in 1937, and the numbers of seedlings occurring under brush, at the edge of brush, away from brush, on gentle slopes, on flat areas, around stumps, etc., will be presented in greater detail after additional annual inspections.

Five of seven subplots of the 1.6-acre Cow Creek seedling-occurrence plot started in 1930 by F. A. Patty were checked in June 1938. The checked portion had an area of about 0.97 acre. Six thousand one hundred and fifty current season Ribes seedlings were estimated and left on the area. The following numbers of older seedlings, by years of origin, were removed: 1937 - 4,100; 1936 - 277; 1935 - 39; 1934 - 7; 1933 - 2; 1932 - 1; a total of 4,426 seedlings removed. No fruiting bushes were found. With the exception of nine R. nevadense plantlets, all the seedlings removed were R. roezli.

Survival and Growth of Ribes Seedlings on Eradicated Areas

A series of small plots has been established on which the Ribes seedlings are counted and recorded annually by year of origin, but are not removed. The method is simple in theory, but somewhat inaccurate in actual practice. As a consequence small discrepancies in the data should be related to the difficulty in rapidly assigning years of origin to plants with any reasonable accuracy. Plants which appear to have sufficient vigor to fruit are removed after they flower. In this way no future regeneration from seeds will result from plants upon the plots. All plants removed are measured in detail for rate of growth.

The following plots now constitute this series: (1) Plot C, Stanislaus, located contiguous to the 1.6-acre Cow Creek seedling-occurrence plot; (2) Plot D, Stanislaus, a small area near the 1.6-acre plot from which a dense clump of snowbrush (Ceanothus cordulatus Kell.) was removed in June 1937 just prior to the initial check; (3) Spanish Ranch #1, Plumas; (4) Butt Creek #1, Plumas; (5) Butt Creek #2, Plumas; (6) Plot G, Chowchilla Mountain, Sierra.

Table 11 summarizes the data collected from seedling-survival and growth-rate plots. Conclusions will be more in order after data from additional yearly inspections are available.

Table 12 summarizes growth-rate data of the plants removed from seedling-survival plots during the last two years.

The total number of plants on Plot G, 24 milacres, contiguous to Plots E and F (Sierra N. F.) was not counted in 1938. Ten of the largest bushes, with an aggregate total live stem of 445.5 feet, were removed on July 26. The total live stem of the ten plants, by years of origin of the stem, follow: 1938 - 307.5 ft.; 1937 - 75.0 ft.; 1936 - 57.0 ft.; 1935 - 4.5 ft.; 1934 - 1.3 ft.; 1933 - 0.2 ft. Total live stem for the ten plants is 445.5 feet. The age distribution of the removed bushes by years of origin follows: 1936 - 7; 1934 - 2; and 1933 - 1; a total of 10 bushes.

Occurrence and Growth of Ribes Seedlings on Burns

Very little detailed plot work concerning the regeneration of R. roezli on burns has been done by the writer. In 1937 six small plots, with a total area of 28 milacres, were established on the burned portion of the 5.6-acre Cow Creek plot (MC #12, California Forest and Range Experiment Station) and some additional data on Ribes seedlings were collected over the burned area as a whole.

The six plots were checked again in 1938. Table 13 summarizes the occurrence of seedlings of sugar pine and R. roezli on these plots during the past two years.

In August 1937, a total of 74 vigorous, 1937-origin R. roezli seedlings were staked on the burned area of the 5.6-acre plot, outside of the six small plots mentioned above. In 1938 these staked, 1937-origin seedlings were re-examined, and about 170 additional vigorous seedlings were staked and recorded.

Table 14 summarizes the growth-rate data on the seedlings first studied in 1937. The average size of the 68 of these seedlings found in 1938 was: in 1937 - 4.7 inches of live stem; on July 2, 1938 - 19.8 inches. Additional annual checks will yield interesting data on the reduction in numbers, and the increase in size, of these 1937-origin seedlings.

TABLE 10

SUMMARY OF CURRENT SEASON SEEDLINGS REMOVED IN 1938 FROM MILACRE SEEDLING-OCCURRENCE PLOTS ON ERADICATED AREAS

Milacre Number	Number of Current Season Ribes Seedlings Removed on Dates Shown				
	Chowchilla Mountain July 23	Chowchilla Mountain, Sierra National Forest, Plot E July 25	Chowchilla Mountain, Sierra National Forest, Plot F July 25	Cow Creek, Stanislaus National Forest June 23	Spanish Ranch, Plumas National Forest September 15
1	255	175	10	308	0
2	278	120	15	1,300	46
3	340	200	130	719	9
4	511	230	50	364	33
5	407	265	20	1,064	17
6	373	165	70	90	2
7	70	150	130	34	3
8	129	140	105	307	6
9	103	65	75	748	21
10	3,112	330	85	543	22
11	-	340	115	-	-
12	-	385	90	-	-
All	5,578	2,565	895	5,477	159

TABLE 11

SURVIVAL OF RIBES ROEZLI SEEDLING-ORIGIN PLANTS
ON SMALL ERADICATED PLOTS

Plot Designation	Date of Check	Number of Plants on Plots on Dates and by Years of Origin as Shown							
		1938	1937	1936	1935	1934	1933	1932	Totals
Plot D, Stanislaus, 4-7/8 milacres	6/25/37 1/	-	99	56	22	15	3	2	197
	6/25/37 2/	-	0	0	0	1	1	2	4
	10/7/37	-	9	3	2	1	0	0	15
	6/28/38	66	6	1	2	1	0	0	76
Plot C, Stanislaus, 21 milacres	6/23/37	-	2,598	200	33	5	3	0	2,839
	7/11/38	1,073	816	87	25	5	1	0	2,007
Butt Creek #1, Plumas, 25 milacres	9/22/37	-	217	24	27	14	2	0	284
	9/13/38	540	62	32	25	4	4	0	667
	9/13/38 3/	0	0	0	5	3	4	0	12
Butt Creek #2, Plumas, 24 milacres	9/22/37	-	101	7	12	12	1	0	133
	9/13/38	364	46	4	10	10	3	0	437
Spanish Ranch #1, Plumas, 4 milacres	9/28/37	-	48	197	38	14	0	1 4/	298
	9/15/38	28	39	77	31	10	0	0	185

1/ Dense snowbrush removed just prior to check.

2/ Bushes removed, one fruiting.

3/ Bushes removed, all fruiting.

4/ Bush removed, 9/28/37, fruiting.

TABLE 12

GROWTH RATE OF BUSHES REMOVED FROM RIBES-SURVIVAL AND GROWTH-RATE PLOTS

Plot Designation	Date Plants Removed	Year of Origin	Number of Plants Averaged	Average Linear Feet of Live Stem Per Bush, by Years of Growth							Total Average Size of FLS
				1938	1937	1936	1935	1934	1933	1932	
Plot G,		1936	7	17.6	6.3	0.4	-	-	-	-	24.3
Chowchilla Mt.,	7/26/38	1934	2	84.2	9.8	25.3	2.0	0.3	-	-	121.6
Sierra N. F.		1933	1	15.8	11.0	3.8	0.5	0.7	0.2	-	32.0
Plot D,		1934	1	-	0.6	0.9	0.3	0.1	-	-	1.9
Cow Creek,	6/25/37	1933	1	-	3.5	3.0	0.8	0.2	0.2	-	7.7
Stanislaus N. F.		1932	2	-	4.6	16.0	2.6	0.8	0.3	0.2	24.5
Spanish Ranch #1, Plumas N. F.	9/29/37	1932	2	-	30.3	6.9	3.2	0.5	0.2	0.1	41.2
Butt Creek #1,		1935	5	14.8	4.4	1.1	0.2	-	-	-	20.5
Almanor Area,	9/10/38	1934	3	24.3	10.4	2.6	0.7	0.1	-	-	38.1
Plumas N. F.		1933	4	10.8	4.5	1.6	0.7	0.3	0.2	-	18.1

TABLE 13

RIBES AND SUGAR-PINE SEEDLINGS ON SMALL, BURNED-AREA PLOTS NEAR COW CREEK RANGER STATION, STANISLAUS NATIONAL FOREST. (MC #12, C.F.R.E.S.)

Sub-plot Number	Milacres in Plots	Seedlings of R. roezli by Subplots, by Years of Origin on Dates as Shown				Total Sugar-Pine Seedlings on Dates as Shown	
		June 30, 1938		Aug. 19, 1937			
		1938	1937	1937	1936	June 30, 1938	Aug. 19, 1937
1	4	1	16	31	0	44	77
2	4	1	15	44	0	6	24
3	4	0	0	0	0	36	48
4	4	2	19	35	0	3	3
5	6	0	10	12	0	15	21
6	6	20	88	131	0	4	8
Totals	28	24	148	253	0	108	181
Average Per Milacre	-	0.9	5.3	9.0	0	3.9	6.5

The size distribution of the 1937-origin Ribes roezli seedlings staked and recorded on the burned area in 1938, including the 68 seedlings reported above, was as follows: 0 to 4 inches of live stem - 55; 5 to 11 inches - 68; 12 to 35 inches - 33; 36 to 71 inches - 13, and 72 to 143 inches - 1; total number of seedlings - 170. The only R. roezli seedlings to be staked were those that seemed to have a good chance of establishing themselves. Besides the staked seedlings, 125 others were counted on the area, and many more probably escaped notice.

This 5.6-acre plot has been under observation for a number of years. An initial eradication was inadvertently given the plot by CCC boys in the fall of 1933, but the observations were continued. In 1938 the following plants were found on the unburned portions: 1938 to 1936 origin - 3; 1935 to 1933 origin - 47; 1932 - 1930 origin - 41; 1929 to 1926 origin - 11; and 1925 to 1922 origin - 2; total number of bushes - 104.

A small 1937 spot burn along the Cow Creek road between Airola Camp and Cow Creek Blister Rust Control Camp, Stanislaus National Forest, was inspected on July 12, 1938. On a plot of about 1.5 square chains, the entire burn, a total of 610, 1938-origin seedlings of R. roezli was found. In the future it is proposed to check this plot once each year.

Another small burn of 1937 origin, on the steep slope northeast of Leland Meadow, Stanislaus National Forest, was inspected in 1938, but no Ribes regeneration of any sort was observed. Another inspection of this area will be made in 1939.

TABLE 14

AVERAGE GROWTH OF R. ROEZLI SEEDLINGS ON BURNED AREA OF 5.6-ACRE COW CREEK PLOT, STANISLAUS NATIONAL FOREST (C. F. E. S., MC #12)

Size Groups in August 1937. Inches Live Stem	Seedlings Staked in 1937	Seedlings Found in 1938	Average Size in July 1938. Inches Live Stem
1 to 1-1/2	9	9	6.5
2 to 2-1/2	19	16	7.8
3 to 3-1/2	14	14	16.5
4 to 4-1/2	8	8	14.6
5 to 5-1/2	4	3	18.7
6 to 6-1/2	5	4	24.3
7 to 8-1/2	7	6	28.5
9 to 11-1/2	4	4	47.0
12 to 15-1/2	2	2	52.5
16 to 19-1/2	2	2	99.0
Totals	74	68	-

One-acre Regeneration Plots

In 1937 a series of 1-acre Ribes regeneration plots was initiated for the purpose of following the re-establishment of Ribes on eradicated areas. Only two plots, the Pilot Peak plot and the Signal Peak plot, both located on the Sierra operation, were established in 1937, and due to lack of time, no more plots of this series were started in 1938.

The plots are selected, staked out, and carefully inspected prior to regular initial eradication, number, size, and fruit production of bushes are recorded by plot subdivisions. After the initial eradication and the regular check, the plots are inspected again, and annually thereafter until another eradication is pending. They are then to be inspected just before and just after each regular eradication and check-out.

In 1938, considerable care and time were taken to inspect these two 1-acre plots. The Pilot Peak plot was checked on August 5-6, and the Signal Peak plot on July 27-28. Tables 15A and 15B record the data collected.

It is apparent from the tables that a considerable amount of the increase, both in live stem and number of bushes, in 1938 over the 1937 data was due to a more accurate inspection in 1938.

Cow Creek (Stanislaus) 10-acre Regeneration Plot

The 10-acre regeneration plot at Cow Creek was logged experimentally under supervision of the California Forest Experiment Station in 1923, was fenced in 1927, and was first checked for Ribes ecology data in 1928. The writer was first responsible for the checking of this plot in 1937, although he assisted in its inspection in 1934 and 1936.

The total number of bushes reported is as follows: 1928 - 77; 1929 - 143; 1930 - 185; 1931 - 139; 1932 - not checked; 1933 - 181; 1934 - 185; 1935 - not checked; 1936 - 227; 1937 - 285; and 1938 - not checked in entirety. The wide variation in number of bushes over the 10-year period is only in part accounted for by natural increase in Ribes population. Variation in the amount of time and care taken in checking the plot in different years appears to be a factor of major importance. It seems certain, however, that the number of Ribes bushes is still increasing 15 years after logging.

In 1937, the plot was divided into 100 one-tenth-acre subplots for convenience in checking and handling of data. In 1938 only 10 selected subplots were checked in detail. In 1937, 108 live bushes were found on these 10 subplots. In 1938, 125 live bushes were found on the same subplots. The higher bush count obtained in 1938 can be attributed to a very heavy hail storm which partially defoliated the brush just prior to inspection, thus making inspection conditions very favorable.

TABLE 15A

SUMMARY OF DATA FROM ONE-ACRE RIBES REGENERATION PLOTS ON ERADICATED AREAS

Plot	Date of Inspection	Size Distribution of Plants, Older Than Current Season Seedlings, Found on Plots								Total Feet Current Season Stem on Plot	Number of Fruit-ing Bushes	Total Feet Live Stem on Plot	Average Size of Bush
		0-4"	5-11"	12-35"	36-71"	72-143"	144"-24'	25'+	Total				
Pilot Peak	9/ 4/37	11 4/	16	11	2	1	1	0	42	?	1/	54.3	1.3
	8/ 5/38	13	43	50	18	5	1	0	130	114.2 2/	0-	235.3 2/	1.8
Signal Peak	10/17/37	41 3/	18	20	14	4	5	0	102	?	1/	219.3	2.2
	7/27/38	18	45	90	41	20	9	3	226	351.8 2/	8	716.7 2/	3.2

1/ Checked too late in season to determine fruiting bushes.
2/ On bushes older than current season seedlings only.
3/ Includes three live crowns without live stem, and twenty-five plants recorded as "seedlings" without year of origin designated.
4/ Includes one live crown without live stem. Current season seedlings, if any, are included in with the older plants.

TABLE 15B

SUMMARY OF DATA FROM ONE-ACRE RIBES REGENERATION PLOTS ON ERADICATED AREAS

Plot	Date of Inspection	Estimated Years of Origin of Bushes Found in 1938 Number of Bushes by Years of Origin								Total Bushes Older Than CSS*
		CSS* 1938	1937	1936	1935	1934	1933	1932	1931	
Pilot Peak	8/ 5/38	230	2	23	43	19	24	13	6	130
Signal Peak	7/27/38	538	20	60	53	22	34	20	17	226

*CSS - Current season seedlings.

The age distribution of the 1938 bushes by estimated years of origin was: 1935 - 4; 1934 - 11; 1933 - 25; 1932 - 18; 1931 - 16; 1930 - 13; 1929 - 15; 1928 - 10; 1927 - 6; 1926 - 5; 1925 - 0; and 1924 - 2; a total of 125 bushes.

A special summary report will be prepared to cover the important data taken on this plot.

The 1936 Ribes-in-brush Plots

In the summer of 1936, eight Ribes-in-brush plots (3 on the Stanislaus, and 5 on the Eldorado) were established to study the occurrence, growth rate, and regeneration of _R. roezli_ in sundry types of dense brush. The original plots which varied in size from about 1/3 to about 4-1/2 acres, were carefully worked and presumably all Ribes were removed. In 1938, these plots were again studied by selecting from the original plots three sample plots each one chain square. On these 24 small plots (2.4 acres), 24 bushes were found having a total of 106.6 feet of live stem. All of the bushes found in 1938 were on the plots in 1936.

The relatively large amount of live stem found on the plots in 1938 is discouraging in view of the careful check that was made in 1936. The difficulties encountered in obtaining complete eradication on small experimental plots may be taken as an index of the difficulties which must be overcome in the practical eradication of Ribes in brushy areas.

The 1938 Ribes-in-snowbrush Plots

A new series of plots was started during 1938 to study the occurrence, growth rate, and regeneration of Ribes, particularly _R. roezli_, in dense snowbrush (_Ceanothus cordulatus_ Kell.). Nine square-chain plots were established in the region of Thompson Meadows Camp (Stanislaus N. F.), and six were placed along the Fish Camp-Summit Camp road (Sierra N. F.). Present plans call for the extension of these studies by the establishment of replicated plots in dense snowbrush for each of the Ribes-density classes recognized in Ribes eradication work on each of the operations where snowbrush is a serious eradication hazard.

Table 16 summarizes briefly the data collected from the 15 established plots of this series.

Growth Rate of R. roezli

Occasional selected bushes or groups of _R. roezli_ bushes are measured in detail to determine rate of growth. The bushes are usually chosen for maximum rapidity of growth. Besides having general significance to the matter or rapid growth, such data may be used to indicate the potential blister rust hazard of the particular areas concerned. Bushes from a single area on the Sierra National Forest were measured for this study during 1938.

TABLE 16

SUMMARY OF DATA COLLECTED IN 1938 FROM FIFTEEN RIBES-IN-SNOWBRUSH PLOTS, STANISLAUS AND SIERRA NATIONAL FORESTS

(ARRANGED IN DECREASING PERCENTAGE COVER OF SNOWBRUSH)

Location	Plot No.[1]	Estimated Percentage Brush Coverage		Estimated Average Height of Brush (Feet)	Estimated Percentage Area Shaded by Timber	Total Number Conifers on Plot[2]	Ribes Bushes Removed from Plot			Total Feet Ribes Live Stem Removed	Total Estimated Ribes Fruits Removed	Average Ribes Bush		
		Snowbrush	Manzanita				Fruiting	Non-Fruiting	Total			Height in Feet	Live Stem in Feet	Number of Ribes Fruits
	St.1	90	5	5.0	0	20	0	3	3	9	0	0.7	3.0	0.0
Fahey Meadows	St.3	85	10	5.0	5	27	11	87	98	826	420	1.0	8.4	4.2
Area	St.2	83	15	5.0	20	0	9	69	78	640	95	1.3	8.2	1.2
	St.4	80	15	5.0	0	12	8	112	120	488	90	0.8	4.1	0.7
Stanislaus	St.5	75	20	5.0	0	20	8	64	72	467	105	1.1	6.5	1.5
National	St.7	60	35	4.5	0	7	5	15	20	161	15	1.4	8.1	0.8
Forest	St.9	55	45	4.0	0	3	5	73	78	309	35	1.1	4.0	0.4
	St.6	20	65	3.0	0	3	1	3	4	16	2	0.7	4.0	0.5
	St.8	20	50	3.5	0	5	6	16	22	245	35	1.4	11.1	1.5
Summit Camp	Si.2	99	0	5.0	1	7	2	6	8	163	20	1.6	20.4	2.5
Road	Si.1	95	0	5.0	0	8	1	6	7	162	25	2.0	23.2	3.6
	Si.6	85	0	5.5	0	3	9	19	28	1,446	2,355	1.7	51.7	84.1
Sierra	Si.3	75	10	3.5	10	13	3	4	7	448	40	1.4	64.1	5.7
National	Si.5	75	0	5.0	5	0	27	67	94	1,558	565	1.5	16.6	6.0
Forest	Si.4	55	15	3.0	15	6	0	14	14	154	0	1.4	11.0	0.0

1/ Each plot has an area of 1 square chain, or 0.1 acre.
2/ No sugar-pine reproduction was found on any of the plots.

Seven very rapidly growing plants were selected from a number of large, seedling-origin plants growing near the turn-around at the end of the road into the south end of Devil's Gulch (NW 1/4, sec. 12, T. 5 S., R. 20 E.). The area selected had been used for loading during the previous logging work. The ground was badly disturbed and thickly strewn with debris. The section was eradicated in 1936, and the small area from which the bushes were selected was ready for rework. Most of the bushes studied were fruiting lightly.

Table 17 records the growth-rate data obtained from these bushes.

TABLE 17

GROWTH RATE OF RIBES ROEZLI, CHOWCHILLA MOUNTAIN, SIERRA NATIONAL FOREST, CALIFORNIA, AUGUST 1, 1938

Location	Year of Origin of Bushes	Number of Bushes Averaged	Average Linear Feet of Live Stem Per Bush by Year of Growth					Size of Bush, Total Feet of Live Stem
			1938	1937	1936	1935	1934	
End of Road. NW 1/4 Sec. 12, T. 5 S. R. 20 E.	1934	1	193.8	51.6	6.2	0.9	0.4	252.9
	1935	4	111.7	37.9	5.2	0.4	-	155.2
	1936	2	141.0	21.8	2.2	-	-	165.0

STATUS OF RIBES ECOLOGY WORK IN CALIFORNIA

Ribes ecology work in California has been in progress since 1928. The scope, objectives, and status of this work may be summarized as follows:

1928-1932. Supervised by F. A. Patty and handled primarily as a field assignment designed to establish, by extensive survey and by controlled plot study, the basic factors affecting dissemination and germination of seed and the growth and distribution of Ribes bushes. The effect of logging and burning and general management plans for sugar pine areas were given special consideration. A full-time crew of six men was assigned to this work during the peak of the field activity. Summaries of the data obtained in this work appear in the 1931 and 1932 annual reports by F. A. Patty and will not be repeated here.

1933-1936. Continuation of small, special plots selected from those established by F. A. Patty. This work was done by George A. Root with part-time assistance of C. R. Quick. Data from this work have little value in themselves but constitute part of the case history of previously established experimental plots.

1937 to date. In 1937, responsibility for Ribes ecology in the western States was assigned to H. R. Offord, and C. R. Quick was placed in immediate charge of the work in the Sugar Pine Region. The objectives of Ribes ecology work now provide for both laboratory and field studies. Because of the limited funds available for methods development work in general, the scope of the field work on Ribes ecology has had to be reduced to a program that could be continued by C. R. Quick working alone, or with the aid of one technical assistant for a period of not more than four months per year.

The objective of the Ribes seed germination experiments being carried on in Berkeley is to determine the normal germinative reaction of seeds of the various species so as to provide: (1) direct experimental evidence on the longevity of Ribes seeds, (2) an adequate supply of plants for experimental use in the greenhouse, and (3) data on moisture, aeration, and soil type in relation to germination and seedling growth.

For best germination, the Ribes of the California sugar pine area require a protracted stratification period of moist cold storage. In general, samples of R. roezli seeds grow very satisfactorily after storage in wet sand at 2.2° C. (36° F.) for 16 weeks. R. nevadense has about the same requirements for germination as R. roezli. R. cereum germinates best after slightly longer periods of stratification. Unfavorable seed storage methods greatly shorten seed longevity, and for this reason, the reactions of most of the available old seed samples are not accurate indicators of longevity. Seeds extracted from a cache of R. roezli fruits buried in 1931 by F. A. Patty and recovered in 1936 germinated very well.

One culture of 100 seeds, stratified for 16 weeks at 2.2° C., subsequently produced 99 seedlings in 5 weeks in the greenhouse. The majority of seeds stored in the laboratory for 10 to 12 years have produced no seedlings when tested. A few samples have germinated weakly. The method best designed to preserve the viability of Ribes seeds is to refrigerate them in airtight containers.

The Ribes ecology field work currently in progress is intended to furnish data through a careful study of small plots. These data will determine the range or variation in the germination of seed and growth rate of established plants which may then be used as a basis for interpreting records of large-scale eradication and checking work.

The field studies on the occurrence of Ribes seedlings are planned (1) to determine the longevity of Ribes seeds stored naturally in forest soil, and (2) to determine the rate of depletion of Ribes seeds in forest soil. The seedling-occurrence studies so far initiated have been confined to particularly favorable Ribes sites, and data thus show the maximum number of R. roezli seedlings which may appear on eradicated areas. From a 1-milacre plot on the Stanislaus National Forest, a total of 5,080 seedlings have been removed in 3 annual checks (1936-1938). From a 1-milacre plot on the Sierra National Forest, 4,246 seedlings were removed at the initial check in 1938.

A carefully eradicated plot of about 1.6 acres, started in 1930 by Patty, is still producing seedlings in great numbers. Current-season seedlings with a density of 8,170 per acre were found on one of the subdivisions of this plot in 1938. Seedlings appear in abundance on most burns the first year after the fire, but practically no mature Ribes bushes survive the usual fire. Plants of R. roezli are much more readily killed by fire than are bushes of Manzanita or Ceanothus. All Ribes seeds may be killed on intensely burned areas.

Studies of Ribes seedlings on certain areas have been undertaken to determine the causes of seedling survival or death, and to record the growth-rate of surviving plants. Soil moisture appears so far to be the outstanding factor affecting survival and growth-rate. Other plants very probably affect survival of Ribes mainly through root competition for soil moisture.

The growth-rate of seedling-origin Ribes varies enormously with variation of habitat. Six-year-old R. roezli plants with only six inches of live stem have been found. At the other extreme an 8-year-old plant with 605 feet of live stem was studied. Other records of rapid growth for R. roezli are: 4-year-old plants with 253 feet of live stem, 3-year with 229 feet, 2-year with 201 feet, and 1-year (seedling of 1936 studied in 1937) with 41 feet. Studies have been started to follow in detail the regeneration of Ribes plants and Ribes populations after eradication work.

Detailed data on the occurrence of Ribes in uneradicated brush fields have been collected to augment the data available from regular checking records. Results of these studies do not offer much hope of blocking out readily recognizable brush types as being Ribes-free. The present objective of the brush study plots is to determine whether one thorough working of certain types of brush fields, particularly snow-brush, will put them more or less permanently on a maintenance basis. Data collected to date are encouraging in this respect, but results over a number of years from a greater number and variety of brush plots are needed before recommendations can be made for practical work.